Chemical Week

April 5, 1952

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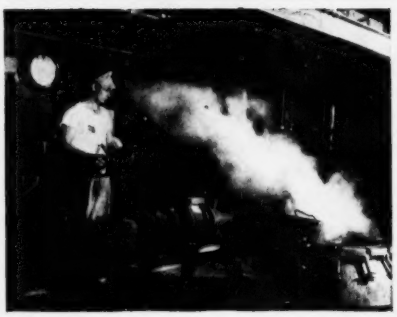

Slash in chemical execs' "take-home" pay spawns rash of stock option plans . . . . . p. 15

GAF's Frye: parlays aviation know-how and chemical research; result: unique plastic . . . . p. 35

New paint plant layout halves construction cost; bonus: twice the output for its size . . . . p. 41

Pulpmakers will be wooed as sodium sellers shift toward derivatives . . . . . p. 55

Look for spate of new miticides; five companies get set to battle for top sales spot . . . . . p. 63

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Chemical Week

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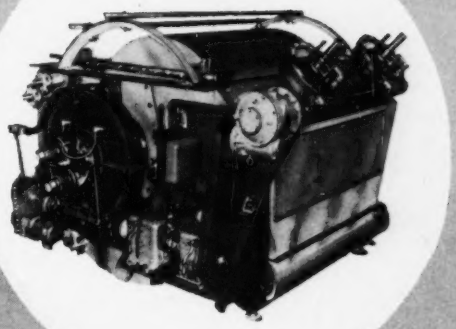

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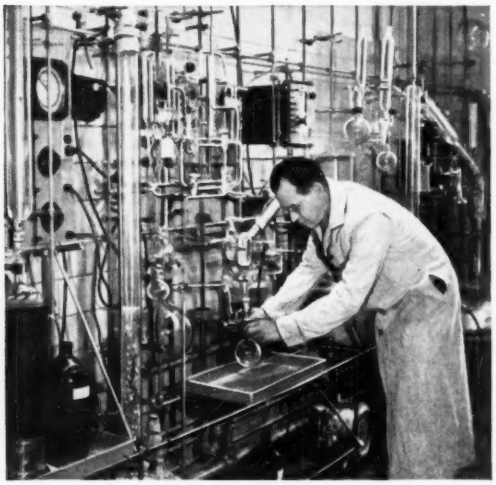
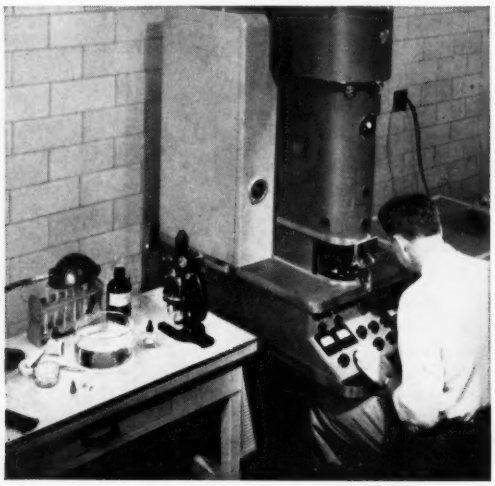


UNDER THE SINCLAIR PLAN, chemistry laboratories like these are open for the first time to independent inventors.



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If the laboratories select your idea, they will make a very simple arrangement with you: In return for the laboratories' work, Sinclair will receive the privilege of using the idea for its own companies, free from royalties.

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HOW TO PARTICIPATE: Instructions are contained in an Inventor's Booklet available on request. Write to: W. M. Flowers, Executive Vice-President, Sinclair Research Laboratories, Inc., 600 Fifth Avenue, New York 20, N. Y.

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OPINION . . . . .

It's "Chloro-Warfarin"

To The Editor: In your note "Rat Blaster" (Mar. 8) we wish to correct the misstatement that our experimental product Tomorin ". . . . . resulted from study of blood anticoagulants at the University of Wisconsin; . . . . ." The new rodenticide Tomorin was discovered in the laboratories of our parent company J. R. Geigy, S.A., Basle, Switzerland. The University of Wisconsin did not participate in any way in that discovery.

An extensive monograph on Tomorin has been published by Reiff and Wiesmann in *Acta Tropica*, Vol. 8, No. 2, pp. 97-130, May, 1951 . . .

G. R. Ferguson
Technical Director
Insecticide Division
Geigy Company, Inc.
Bayonne, N. J.

Thank you, Reader Ferguson. We erred, indeed, in saying that the University of Wisconsin participated in the Tomorin development. As we said, Warfarin, 3-(a-phenyl-B-acetylethyl)-4-hydroxycoumarin, and Tomorin, 3-(a-p-chlorophenyl-B-acetylethyl) -4-hydroxycoumarin, are similar chemically. And, Warfarin, of course, was a product of anti-coagulant studies at Wisconsin.—Ed.

Synergistic Chromium

To The Editor: We have read with much interest Prof. S. S. Block's article on "Chemicals for Fungus Control" (Jan. 26). The field is a tremendous one and Prof. Block has done well to cover it and mention so many of the important chemicals. . . . We feel, however, that a significant omission has been made . . . by his failure to cover adequately the importance of chromium as an ingredient of many commercial preservatives. . . .

In 1950, according to the annual report issued by the U.S. Forest Service in cooperation with the American Wood Preservers' Association, 5,402,-080 lbs. of wood preservatives containing chromium (chromated zinc chloride, Wolman salts, Celcure, copperized chromated zinc chloride, Greensalt and Osmose) were used, in comparison to 2,245,067 lbs. of Prof. Block's "Big Bertha," pentachlorophenol.

Use of these chromium-containing materials increased 27.8% in 1950 over 1949, as contrasted with a drop in total wood treated of 0.6% and in pentachlorophenol consumption of 1.9%. Chromium compounds, used principally as sodium and potassium bichromate and sodium chromate, have found a useful place in the wood preserving industry . . . their merit has been recognized both by their expanding use and their acceptance as tentative standards of the American Wood Preservers' Association. . . .

Greensalt-treated poles have been found equal to creosoted poles in service . . . are being installed in large numbers in metropolitan services . . . and there are several thousand ties treated with this preservative in track at Gainesville.

A fungicide consisting of copper and zinc basic chromates has recently been developed and has proved highly successful for control of potato and tomato blight. The research at the Boyce Thompson Institute* which led to this discovery showed clearly that this combination of metallics was much more effective than could have been expected from the characteristics of the constituent salts.

In the rot-proofing of fabrics, Dr. Ralph Siu has reported in his recent book "Microbial Decomposition of Cellulose," that combinations of copper and chromium are far more effective than salts of either element alone. There are other proofs of the fungicidal effectiveness of chromium in combination with heavy metals; paints formulated with zinc chromate pigment have shown excellent mildew resistance under conditions where additions of commercial fungicides such as pentachlorophenol or copper-8 have been unsuccessful. Chromate conversion coatings on zinc-plated electrical equipment also show mold resistance where the untreated metal becomes covered with mold and the equipment inoperative.

In view of the established value of chromium compounds . . . it is unfortunate that they were overlooked in Prof. Block's paper.

Winslow H. Hartford
Research Supervisor
Mutual Chemical Co. of America
Baltimore, Md.

On the Horizon: Sulphur

To The Editor: . . . I notice the following news item in your issue of Nov. 17, '51:

"**Sulphur:** The current world sulfur shortage has been further alleviated by the discovery of the Fuel Research Institute at Dhanbad, India, that large quantities of sulfur can be recovered

* *Contrib. Boyce Thompson Inst.* 15 (4): 195-210, July-Sept. 1948. "Development of Copper-Zinc-Chromite Complexes as Potato Fungicides, by J. B. Harry, *et al.*

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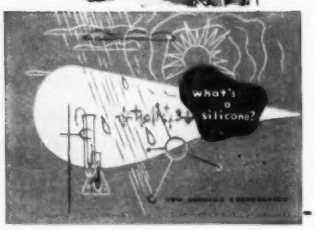

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OPINION . . . . . .

by washing coal. Experiments at the Nowrozabad mines show that a single washing yields 11% sulfur, rewashing 20%. A local cement firm now plans to put up a coal washery to supply both fuel for its plant and 1,200 tons of sulphur per month as by-product.

"Pyrite deposits covering an area of some 12 miles in the coastal area of Larwar (near Bombay) are also expected to yield an additional 4,000 tons of sulfur a month. India has been importing some 65,000 tons of sulfur annually, mostly from the United States."

. . . The Fuel Research Institute, has shown that pyrites can be separated from some of our coals. The work is on recovery of pyrites . . . not elemental sulphur, which is difficult (though not impossible) to get from pyrites economically.

A study of Nowrazabald (Rewa) coals has revealed that the rejects contain a high percentage of pyrites . . . attempts are now being made to work out an economic method for separating pyrites from rejects. A rough estimate places the recovery at two tons of pyrites (about one ton of sulphur) per 100 tons of coal; and by establishing a coal washery of a capacity of 150 tons per hour, it might be possible to obtain nearly 9,000 tons of sulphur per annum.

Considering that India's normal requirement of sulphur is of the order of 50,000 to 70,000 tons per annum, this source will, when it starts working, help to remedy the deficiency. The practical application of this work in the near future will contribute substantially towards providing a dependable indigenous source to meet India's sulphur requirements.

As regards pyrite deposits no [official] report has been sent out by this Ministry . . . the Technical Officers are at present carrying on the work there . . .

S. S. Bhatnagar
Secretary to the Govt.
of India
New Delhi, India

Organized, Not "Unionized"

To The Editor: There has been much comment among the chemists and professional employees of the Texas Co. relative to your statement (Mar. 8) . . . "Some 300 chemical laboratory workers at the Texas Co.'s Port Arthur refinery voted to join their fellow Oil-workers in the scheduled industrywide strike . . ."

The 300 lab workers in question were non-professionals—not chemists—and they did not vote (at least it

Something to be proud of!

The Chemical Industry can well be proud of the tremendous progress it has made in a relatively few years.

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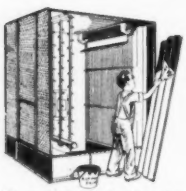
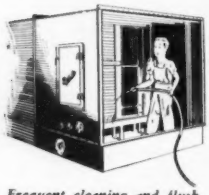


Air washer eliminator plates should be painted yearly or oftener if necessary.



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OPINION . . . . . .

was never officially announced here) to join in the strike voted by local 23 CIO-OWIU. Of course, due to their CIO affiliation, they would probably honor any picket lines drawn up by their 3,000-odd brethren.

The professional employees of the Texas Co. . . . were especially perturbed . . . since they belong to an embryonic Association which stands to suffer prestige by the adverse publicity accorded it by your article. . . . The chemists and engineers of the Port Arthur Works are "organized" but definitely not "unionized" . . . i.e., certified by the NLRB as a bargaining agency. . . .

I would appreciate your correcting the impression you have inadvertently created regarding our Association. . . .

VERNON H. KANE
President
Assoc. Prof. Engineers, Chemists and Scientists
Port Arthur, Texas

Thanks, Reader Kane, and in case anyone drew any erroneous inferences from CW's statement, here are additional facts: (1) The 300 lab workers are high-school graduates, carry out routine tasks. Top title: "Technical Leaderman." (2) They are a unit of Local 23 CIO-OWIU, are affiliated with general local 23, which includes 3,500 Texaco refinery workers, 3,500 Gulf refinery workers, 250 Gulf Lab workers. (3) They have negotiated a separate contract with the Texas Co. (4) Chemists and professional employees in general have traditionally been considered more a part of management than of labor and have, as Reader Kane once said, ". . . always stood between management and labor with neither group particularly wishing to assimilate them. However, with the advent of strong labor organizations, the economic status of labor has improved to such an extent that the superior status formerly enjoyed by professionals has all but been matched. We would like to regain some of our lost economic advantage and prestige . . . have organized to exert our collective force. . . . We would like, however, to retain our position as confidantes of management rather than opponents, which is the usual labor union viewpoint."—ED.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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CARDIS® 320	180-185	5-7	4-5	30-32	80-85	EMULSIFIABLE PETROLEUM WAX
CARDIS® 262	195-200	4-6	BROWN	14-16	40-45	SPECIALLY PROCESSED PETROLEUM WAX
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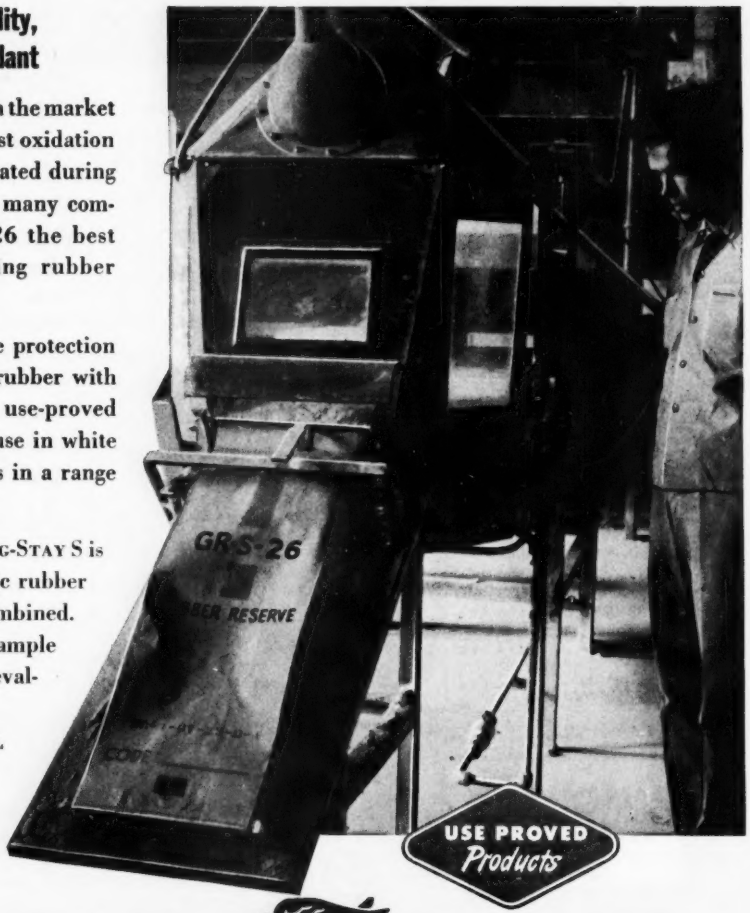

GOODYEAR

Wing-Stay—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

NEWSLETTER

Looking beyond U. S. borders for business is fast developing into a major trend among the chemical process industries (CW, Feb. 23, Mar. 8, ff.). Export subsidiaries are springing up week by week.

Latest firm to join the ranks is American Cyanamid—by setting up Chemical Construction (Inter-American) Ltd., which will look northward to Canada and southward to Central and South America for chemical plant design and construction projects. Headquarters: Toronto.

Its activities will parallel those of Chemical Construction Corp., which operates in the U. S. and the rest of the world.

A small, two-year-old chemical firm got a boost toward bigness in the form of a $39,900 loan from RFC.

The company, Halocarbon Products Corp. (CI, July '50, p. 25), makes polytrifluorochloroethylene oils, greases and waxes inert to acid. DPA advised RFC that the materials are essential for defense, and there's a shortage of production facilities.

The North Bergen, N. J. company is putting up $8,000 of its own money, and RFC gets a first lien on present equipment and new machinery to be bought with the proceeds of the five-year, 5% loan.

Synthetic fuels protagonists and antagonists will be chewing over the Ebasco report, scheduled for issue this week by the Interior Department.

Ebasco Services, Inc., was retained last November to survey coal hydrogenation costs—in effect, to "umpire" the controversy between the Bureau of Mines, which claimed an 11¢-per-gallon gasoline cost, and the National Petroleum Council, whose 43½¢-per-gallon figure (CW, Nov. 17, '51) wasn't even slightly coincidental.

Best bet: Ebasco's figures will look more like NPC's than the Bureau's, will dampen enthusiasm for a Government gasoline project.

The State of Oregon has softened its crackdown on stream pollution by pulp and paper makers. Reason: The state's Sanitary Authority is convinced that the mills are making a sincere effort to abate pollution.

Extensions beyond May 1 have been given to three mills.

State pollution control activities are making news another way, too. The Virginia State Water Control Board has gone on record against the Federal Government's program, calls it a "wasteful duplication of effort now being expended" by state agencies.

Virginia, one of eight states banded together to clean up the Ohio River Drainage Basin, was mentioned in a recent U.S. Public Health Service report as having towns and manufacturing establishment in need of pollution abatement facilities. U.S.P.H.S. is the agency in charge of the Federal anti-pollution work.

Four chlorinated solvents are in for healthy expansions if DPA's latest goals—target date: Jan. 1, 1955—are met.

They call for: 1) tripling carbon tetrachloride and trichlorethylene capacity; 2) more than doubling perchlorethylene capacity; and 3) nearly doubling methyl chloride capacity.

Be on the lookout for the Federal Security Agency's controversial bread standards around the end of the month.

The standards will—as originally proposed—rule out synthetic emulsifiers. As a sop to manufacturers of these products, there may be another hearing at which they can present their case again.

But don't expect producers to buy this. The odds are that they'll press their case in court, not in further hearings.

Upjohn is excited about a microbiological oxidation process that could: 1) reduce the number of steps in making cortisone from ox bile; 2) make practical using other steriods—e.g., ergosterol—as a starting material.

Company researchers have been able to put a ketone group in the 11 position on the steriod structure. The produce is a cortisone intermediate—not cortisone itself.

The wool-synthetics fight continues to rage on the consumer level. In a special section on men's apparel in Sunday's New York Times, there was a chart on different synthetics, their properties, applications.

But in the same supplement, a group of clothing makers bought a page ad to say: "There is no substitute for wool."

Substitutes for natural fibers or no, ACS members at the Buffalo meeting, heard these estimates by Carbide's Howard Bunn (see also page 16):

While he mentioned that production of vinyl and acrylic fibers—such as Orlon, Dynel (CW, Mar. 8)—is about at a 100 million pound-per-year rate, he gave production figures on some not-so-well-publicized materials, viz.:

- Dow's saran has reached the 40 million pound-per-year mark, with further expansion in the works.
- Du Pont's 1951 nylon capacity was at 170 million pounds, 20 million of it staple.
- Chemstrand will make 50 million pounds of nylon staple annually beginning 1953.
- Vinyon HH staple, a Carbide-American Viscose fiber, is currently being produced at close to 2 million pounds a year.
- A polyvinyl acetate fiber, insolubilized with formaldehyde, is being made in Japan under the trade name Carilan at a 6 million-pound-per-year rate.
- Imperial Chemical Industries is building a Terylene plant with a capacity of 11 million pounds a year.

Sodium nitrate for fertilizer use, scarce because of a strike in Chilean nitrate fields, is 6,000 tons shorter this week as a result of an explosion-fire in two dockside Savannah warehouses. Cause of the blast is still undetermined. The loss was over half a million dollars.

First platformer-Udex combination plant to go onstream is Eastern States Petroleum Co.'s Houston unit which started operation March 25. Capacity is 200-bbls.-a-day of benzene, smaller amounts of toluene. Later, mixed xylenes and ethyl benzene may be produced.

Main advantage of such a unit: Operating on straight run gasoline raw material, it can be easily adapted to produce a variety of aromatics.

. . . The Editors

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BUSINESS & INDUSTRY . . . . .

REPRESENTATIVE STOCK OPTION, PURCHASE PLANS

These companies	have made available this number of shares	to this number of employees	at this per-cent of market value	for this option period
Atlas Powder*	25,000	50	95	10 years
Commercial Solvents	50,000	few key	95	7 years
Dow	44,000	all	about 74	
Diamond	80,000	78	95	
Food Mach. & Chem.	100,000	8,484	85	
Glidden	100,000	150	95	
Int. Min. & Chem.	125,000	key	95	10 years
Int. Paper*	250,000	key	95	10 years
Mathieson	200,000	200	95	not over 10 years
Merck	129,650	key	95	10 years
Minn. Min. & Mfg.		all (except directors)	90	
Monsanto	150,000	key	100	10 years
Chas. Pfizer	250,000	3,300	95	5 years
Pittsburgh Plate Glass	450,000	4,000	95	5 years
Thiokol	25,000	315	90	2 years
Victor	100,000	1,450	85†	10 years

* Plan awaiting stockholder approval
† 95 while SSB regulations are in effect

Incentive in Ownership

Stock option and purchase plans to boost key employees' earnings win new favor with chemical companies.

Salary stabilization regulations put lower price limit at 95% of market price, but SSB is considering a change that may help some companies.

Firms wanting to extend such plans to rank and file must get WSB approval, but policy parallels that for salaries.

Granting stock options to key employees is a good way to boost incomes of chemical executives, to keep them happy, to keep them. That's a conclusion stockholders in various companies in the chemical process industries—who will be asked to vote on many such proposals this and next month—can hardly escape.

The reason for these firms turning to stock options or stock purchase plans is simple: They seem to be about the only ways, under salary stabilization regulations, to allow rewards commensurate with the contributions these key men have made to the tremendous chemical expansion of the last few years. This is especially true in the case of companies in the big money for the first time, although long-established companies with histories of ample salaries also like to grant their top men this chance to share in the companies' growth potentials.

For a man in the high-income bracket pays the Government a real chunk of any pay boost in personal income taxes. But if he buys stock at a discount, any profit from its sale (not less than two years after option is issued) is taxed as a capital gains, a maximum of 26% instead of the much higher income tax rate. With companies growing as fast as most chemical firms, of course, the stock's a buy even at the market price.

Tight Rules: Under current Salary Stabilization Board rules, stock can be offered to executives at 95% of the market value without any special SSB approval. Options at 85-94% may be offered with prior SSB o.k., but a discount over 5% must be charged to any salary increase allowed the employee under SSB rules. (The Revenue Act of 1950 permitted options as an incentive to ownership at 85% of market price, but SSB froze such deals Jan. 25, 1951 until last fall when it allowed them again with certain restrictions.)

However, the board is considering a change that would permit a company which in the past has used stock sales to employees as a means of raising capital, to continue the practice at less than 95%. The board may be hard to convince of this in many cases, but just the same it opens up new possibilities.

After all other provisions have been met, the company must top everything with a promise it will not use the plan as an excuse to seek a price increase.

Corporations granting stock options or purchase agreements after the Jan.

25, 1951 date, are required to file a copy of the plan with the Office of Salary Stabilization. Plans put into effect before that date don't come under the regulation.

Stock purchase plans follow the general lines of the rules governing options. For example, an employee buying the stock under any plan not requiring prior SSB approval, must pay at least 95% of the market value for it.

An employee starting a stock purchase plan must finish the payments before selling the stock. Dividends must be applied on purchase price until shares are fully paid. This is to make certain the employee's current income is not directly increased by stock purchase. And payments for the stock each year must be at least twice all dividends.

Not All Brass: The sampling of companies with stock option and purchase plans listed in the accompanying table (including some plans in effect before Jan. 25, 1951; some just approved; and others awaiting stockholder and/or SSB approval) reveals that a few firms are extending them to the rank-and-file as well as executives. Here the income tax angle is not so important a consideration because the capital gains feature means little to the little fellow. But it does build employee morale, spreads ownership among the people who work for the company, helps to increase workers' understanding of management's viewpoints, and tends to cut down on labor turnover.

Not all companies go along with the idea however. In addition to the difference in the tax base of executives and workers, they point to the large number of shares a big company would have to set aside, and to past bitter experiences during the depression when workers saw stocks bought at fancy prices tumble fast. Also they think executives contribute most to company progress, should profit most.

The Wage Stabilization Board policy, just formulated, is the same as SSB's rules for stock options, except that in every case approval must be obtained. Any price below 95% of the market must be charged against any allowable wage increases. Most companies, though, believe that the 95% figure doesn't allow enough incentive for a worker to buy, nor enough protection in case the market slips.

Leading Proponent: Dow, however, this year continued its four-year-old policy of offering stock. In January, it made a block of 44,000 available to employees; 45% of those eligible subscribed. Price was $82.50 per share (same as pre-emptive offering to common stockholders); the market at the time was about $112. WSB regulations affect the plan: if the price goes above $117.50 when employee takes delivery, he may have to pay more than $82.50. Employees pay cash or on payroll deduction over a period of several months. They may pay up, cancel or reduce subscription any time before final payment is made.

The price is, of course, below WSB's 95% and the Bureau of Internal Revenue's 85%, so Dow employees, when stock is delivered, have to pay income tax on the part of their paper profit in excess to the allowable 15% deduction from market price. Last year, because the stock jumped so in value, the company had to help employees with their big tax bill; but it figured they were ahead of the game, and they enjoyed a bigger cushion against a drop in price than they would have if the stock had been offered at 85%.

Others Agree: Another fairly old (1949) companywide purchase plan is Minnesota Mining & Manufacturing's, which permits employees (except directors) to buy at 10% below the market figure. Chas. Pfizer and Food Machinery & Chemical are the two most recent advocates. The former was originally going to offer 250,000 shares to some 3,300 employees at 85% of the market; but it is now going along with WSB's 95% ruling. The company doesn't think that will discourage purchase, is convinced employees will "buy" the company's future, not just go for a few dollars' bargain.

Food Machinery is still hassling with WSB on its first venture in this field of employee relationships. Last December, 100,000 shares were offered at 85% of the market under a plan which made shares available to executives and employees in general on basis of income. Those who availed themselves of the opportunity don't know where they stand yet, as the company is waiting for WSB approval.

But despite these obstacles, other companies are eyeing rank-and-file participation.

Stock Answer to Suggestions

FOURTEEN WORKABLE SUGGESTIONS nets share of Abbott Laboratories stock for James Pertle (right), makes him "suggestion star of 1951." Shown receiving stock certificate from Abbott v.p. and treasurer James F. Stiles, Pertle offered a total of 17 ideas for improvements, and was top man at Abbott, where 862 employees came through with 1,837 ideas, received $9,730 in awards.

Fibers on the Frontier

The dawn of Monday, March 24 found a crisp breeze winging in from Lake Erie and the membership of the American Chemical Society firmly entrenched in the city of Buffalo—nerve-center of the industrial Niagara frontier. The setting was appropriate. For the chemistry and technology of the Niagara frontier set the pace for the 121st meeting of the ACS.

American Chemical talent wasn't caught napping. By early Wednesday afternoon, 2,900 chemist and engi-

neers had thronged to the registration desks on the thickly carpeted mezzanine level of Buffalo's Statler Hotel. Most came from the big industrial and academic centers. But the whistle-stops – Winooski, Vt.; Huntington Woods, Mich.; China Lake, Cal.; Socorro, N.M.—were not to be outdone.

Domestic and Exotic: The roster of home towns was a chemical cross-section of the nation. And the domestic flavor was garnished by a dash of international spice from members who had planed in from Belgium, Sweden and Switzerland. Needless to say, Canada—minutes away—was amply represented.

As expected, academic papers in the fields of analytical, biological, colloid, inorganic and organic research occupied a generous share of the program. But, in the opinion of many, fibers stole the show.

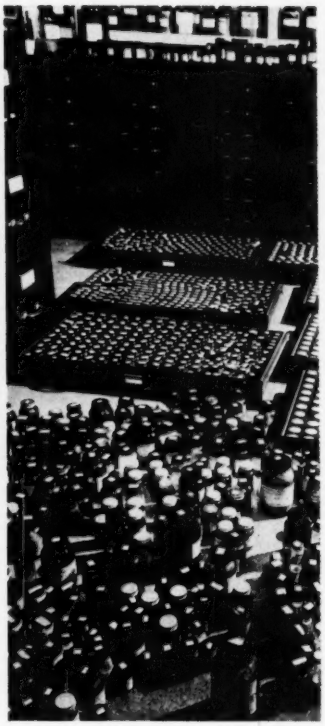
Biggest crowd-pleaser at this Buffalo meeting was the division of industrial and engineering chemistry's symposium on the status of newer synthetic fibers, headed up by Union Carbide's Carl A. Setterstrom. Close to 600 avid listeners jammed the Statler's wood-panelled Empire State room Wednesday morning to hear Du Pont's Winfield Heckert (on selection of fiber monomers), Brooklyn Polytech's Herman Mark (molecular structure and fiber properties), Textile Research Institute's John H. Dillon (comparative tensile properties of the newer synthetics).

Lowdown on Fibers: High point came during the afternoon of the fibers session. Speaking to an overflow crowd, Bakelite Co.'s able vice-president Howard Bunn tied up the synthetic fibers raw materials package

HOWARD BUNN: The fiber bundle, with no loose ends.

Current List of DPA-Certified Chemical Facilities

Company and Location	Product	Amount Applied for	Amount Certified	% Certified
Hercules Powder, Paulsboro, N.J.	Phenol	$8,500,000	$8,500,000	50
National Lead, Perth Amboy, N. J.	Antimony oxide	194,066	194,066	60
Du Pont, Gibbstown, N. J.	Diphenylamine	204,000	204,000	50
	Aniline	107,000	107,000	60
Pennsylvania Industrial Chemical, Chester, Pa.	Chemicals	7,640,800	7,640,800	60
Koppers Pittsburgh, Kobuta, Pa.	Phthalic Anhydride	4,000,000	4,000,000	50
Rohm & Haas, Bristol, Pa.	Hydraulic oil components	740,994	605,265	65
			68,366	15
Rohm & Haas, Philadelphia, Pa.	Ammonium sulphate	240,718	213,878	45
National Lead, Philadelphia, Pa.	Lead comps.	106,422	106,422	45
Morton Withers Chemical, Greensboro, N. C.	Petroleum sulfonates	1,780,742	1,236,428	65
			353,314	45
			186,000	15
Monsanto Chemical, Nitro, W. Va.	Rubber cure comps.	485,600	485,600	60
		106,200	106,200	60
Air Products, Weirton, W. Va.	Oxygen	114,364	114,364	60
Monsanto Chemical, Anniston, Ala.	Tolylene diisocyanate	211,000	211,000	70
Sloss-Sheffield Steel, Birmingham, Ala.	Benzene	73,170	73,170	90
American Cyanamid, Savannah, Ga.	Titanium dioxide	13,875,000	13,875,000	45
Standard of Ohio, Lima, Ohio	Alkylation feed stock	12,375,000	7,987,000	65
			4,388,000	40
Lubrizol, Wickliffe, Ohio	Chemical additives	887,131	325,403	15
			196,362	45
			247,511	65
Standard of Ohio, Cleveland, Ohio	Alkylation feed stock	6,719,000	1,787,600	65
			1,744,400	45
			3,187,000	25
Dow Chemical, Midland, Mich.	Chemical products	998,200	998,200	45
American Zinc of Ill., Fairmont City, Ill.	Sulfuric acid	359,631	355,301	70
Monsanto Chemical, St. Louis, Mo.	Benzoic acid	700,000	262,500	50
Hugoton Production, Ulysses, Kans.	Butane, propane	300,000	280,403	65
Panhandle Eastern, Kansas City, Mo.	Isobutane, propane	510,000	510,000	55
Stanolind Oil & Gas, Grant County, Kans.	Isobutane	286,000	286,000	90
National Lead, St. Louis, Mo.	Silicate white lead	150,602	150,602	45
Alcoa Mining, Love Hollow, Ark.	Chemical limestone	325,750	325,750	70
Pan-Am Southern, El Dorado, Ark.	Polybutylene	250,000	215,000	65
Texas City Refining, Texas City, Texas	Aviation alkylate	2,500,000	2,480,000	50
Esso Standard, Baton Rouge, La.	Octyl alcohol	477,000	326,000	70
Sinclair Refining, Houston, Tex.	Barium sulfonate	175,000	98,650	65
			23,700	50
			23,480	15
Warren Petroleum, Tulsa, Okla.	Propane, butane	644,340	566,320	65
Phillips Petroleum, Ector County, Tex.	Propane, butanes & pentanes	5,446,400	3,765,800	65
			1,680,600	40
Lubrizol, Deer Park, Tex.	Chemical additives	2,044,139	444,437	65
			548,637	45
			655,807	15
Phillips Petroleum, Borger, Tex.	Cyclohexane	1,899,700	1,230,990	90
			325,090	45
	Propane, isobutane	2,165,055	1,852,050	65
			111,418	40
			19,190	15
Del Ray Petroleum, Eagle Lake, Tex.	Natural gasoline, butanes, propanes	371,422	364,009	65
			7,413	15
Nyotex Chemicals, Houston, Tex.	Hydrofluoric acid	88,737	88,737	40
Reynolds Metals, Corpus Christi, Tex.	Aluminum pig	1,573,000	1,545,000	80
Dow Chemical, Freeport, Tex.	Chemical research	2,600,000	undeterm.	45
	Chemicals	5,000,000	4,984,500	45
	Magnesium, etc.	625,000	625,000	45
	Chloroform, hydrochloric acid	215,000	215,000	60
Freeport Sulphur, Flaminques Parish, La.	Sulfur	13,825,000	13,825,000	70
Shell Oil, Deer Park, Tex.	Hydrogen sulfide	86,500	86,500	70
	Aviation gas comps.	1,000,000	1,000,000	90
Diamond Alkali, Houston, Tex.	Perchlorethylene	2,298,550	2,276,550	50
Magnolia Petroleum, Midland and Upland Counties, Tex.	Natural gas, butanes, propanes	371,422	364,009	65
			1,237,329	40
			26,865	25
Ozark-Mahoning, Jackson County, Colo.	Fluorspar	852,676	752,230	60
Union Oil of Calif., Wilmington, Calif.	Sulfur, ammonium sulfate, fuel oil	750,000	679,200	70
			70,800	45
	Sulfur	450,000	416,000	70
			34,000	45
Pacific Coast Borax, Wilmington, Calif.	Boric acid	199,074	199,074	30
Shell Oil, Martinez, Calif.	Sulfonates	476,000	414,000	65
			62,000	40
Monsanto/Tide Water Associated, Avon, Calif.	Sulfuric acid	2,050,000	2,050,000	35
J. R. Simplot, Meyers Cove, Ida.	Fluorspar	264,800	174,740	70
General Aniline & Film, location not shown	Photo film chemicals	1,600,000	1,509,500	45



Men . . . and Materials

Among the many firms who have trained their guns on tuberculosis (*CW, Mar. 8*), E. R. Squibb & Sons has likely spent as much time and effort as any—and has hit the target with Nydrazid, isonicotinic acid hydrazide.

In retrospect it looks easy, for the compound is relatively simple. But it took a large company of workers five years—more than a million man-hours and more than a million and a quarter dollars—to prepare and test over 5,000 compounds and narrow them down to one. Martyrs to the cause: 50,000 mice who died of TB.

—with no loose ends. Bunn told the story from acrylonitrile to zein, broke it down from every angle, left his audience arm-weary from note-taking at a breakneck pace.

Typical of what Bunn had to say at machine-gun speed: Last year 1,212 million pounds of caustic went into rayon production . . . 303 million pounds of carbon bisulfide . . . 1,125 million pounds of sulfuric acid . . . 1,082 million pounds of cotton linters or wood pulp. Acetate production took 729 million pounds of acetic anhydride . . . 1,072 million pounds of acetic acid . . . 86 million pounds of acetone . . . 300 million pounds of pulp.

Although industry gave—and generously—it also came in the hope of taking. Technical manpower was the object of its affection, and it wooed in masterful style at the Society's employment clearing house. Space was at a premium on help-wanted bulletin boards. Applicants, in an enviable position, did plenty of shopping. One job-seeker coyly sat through 26 interviews, left unattached.

Employment skirmishes centered at the clearing house, but several enterprising firms did some aggressive free-lance campaigning. Westvaco, for example, entertained prospects in a fifth-floor Statler suite, ran off a film on the advantages of a Westvaco career.

By late Thursday afternoon, the ACS was packing. An air of rush and bustle to catch early trains and planes permeated the convention lobbies. The consensus was that the 121st meeting had been an unqualified success.

Money Woes: One discordant note was sounded. And that by a soft-spoken, New England professor. His plaint: many educators just can't afford a five-day meeting in a distant city.

In his own words: "Our colleges and universities don't pay our expenses as industry does for its men. The educational institutions pay our rail fares . . . but it ends there. On a convention . . . like this one, it's too expensive for most of us to attend out of our own pockets."

LEGAL . . . . . .

Texas Gas Case: The trial of test cases in Texas' natural gas "gathering" tax dispute has been postponed until April 7. District Judge Roberts of Austin will then take up the suits filed by two pipeline companies to recover taxes they paid under protest since last September. Several chemical companies also have lodged protests against paying the tax.

On the other hand, Southern Minerals Corp., which paid under protest for five months, has advised the state comptroller it no longer objects. A study of the new tax, says Southern Mineral's president, convinced the company that it is fair and equitable.

LABOR . . . . . .

Koppers Strike Ends: The 46-day strike of workers at Kopper's Oil City, Pa. plant has come to an end. Final terms were a compromised 10¢-per-hour wage increase, a company agreement not to hire outside contractors for work that could be done by the Gas, Coke & Chemical Workers union's maintenance men, and a provision that workers will not be transferred from one seniority group to another.

An interesting feature of the new contract is that it provides for a wage increase in six months for the amount of the difference between the present raise and the hike expected to result from steel and oil negotiations. In other words, the chemical union is gambling on the success of steel and oil, with or without strikes, and the company is agreeing to take these industries as patterns.

Among other unusual clauses was a provision that the company eliminate a job evaluation program.

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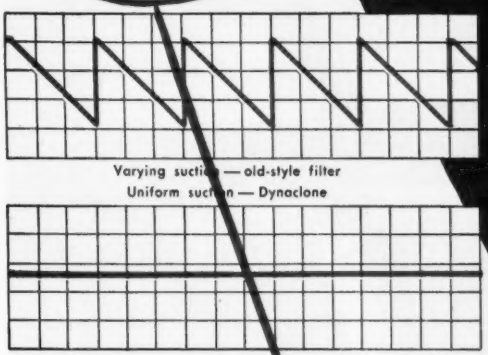

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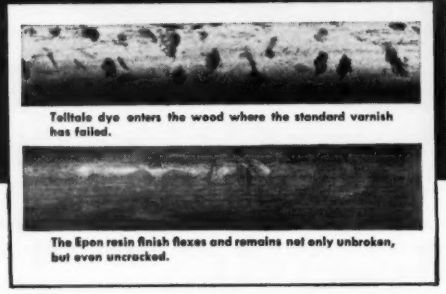

Telltale dye enters the wood where the standard varnish has failed.

The Epon resin finish flexes and remains not only unbroken, but even uncracked.

YOU CAN EASILY MAKE this simple dowel test yourself!

The Set-Up. Coat two hardwood dowels with a standard brand of varnish. Coat another pair with an Epon resin-based finish. Age them, if you wish, to develop the maximum brittleness. Now strike them together, just as hard as you can. When you have done your worst, rub a "telltale" dye over the surfaces.

The Result. The standard varnish cracks and flakes . . . as emphasized by the dye penetration into the wood. The Epon resin finish *follows the dented surface without any sign of chipping, flaking or dye penetration.*

The Reason: The Epon Resin molecule is an entirely new class of polymer with evenly spaced reactive groups which permit it to cure to a flexible film. Also, its polar nature contributes outstanding adhesion. As a plus value, Epon resins have excellent resistance to detergents, caustic and many acids.

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TOMORROW WILL YOU BE SATISFIED WITH THE JOB YOU DID TODAY?
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Security Step-up

MAKING WORKERS CONSCIOUS of the need for industrial security is the objective of a program planned by the Munitions Board. Cartoons, multi-colored posters and pay envelope stuffers are included in monthly mailings to industrial firms. The program is a repetition of World War II security efforts, but this time industry will be "bothered by only one agency." The first mailing included 750 mats for reproducing this cartoon, 29,000 posters and 1,500,000 envelope stuffers.

Bonneville Bounty

Thirteen electroprocess plants receiving power from the Bonneville Power Administration produced about $250 million worth of metals and chemicals in 1951.

A statistical summary by BPA reveals that during the year these plants accounted for a federal income of some $17 million, with local taxes totaling $1,600,000 and wages paid to workers estimated at $32 million.

Current investment in plant and equipment of the electroprocess industries served by BPA totals about $300 million, compared with a federal investment in Pacific Northwest projects of around $400 million.

The summary reveals that in the period from 1940 through 1951 electroprocess plants supplied by Bonneville produced about $1.4 billion worth of aluminum and aluminum sheet, rod, wire and cable; magnesium, chlorine, caustic soda, chlorates, ferroalloys, calcium, carbide, silicon carbide and elemental phosphorus.

Electroprocess plants included in the summary are:

Aluminum Co. of America, Vancouver, Wash. (aluminum rod, wire and cable)

Carborundum Corp., Vancouver, Wash. (silicon carbide)

General Service Administration, Spokane, Wash. (ferroalloys and magnesium)

Kaiser Aluminum and Chemical Corp., Spokane and Tacoma, Wash. (aluminum and aluminum sheet)

Keokuk Electro-Metals Co., Rock Island, Wash. (ferroalloys)

Pacific Carbide and Alloys Co., Portland, Ore. (calcium carbide)

Pennsylvania Salt Manufacturing Co., Portland (chlorine, caustic soda and chlorates)

Reynolds Metals Co., Longview, Wash., and Troutdale, Ore. (aluminum)

Union Carbide and Carbon Corp., Portland (ferroalloys and calcium carbide)

Victor Chemical Co., Silver Bow, Mont. (elemental phosphorus)

After "Impact"

A seventeen-man team from the British chemical industry is the latest group to make the safari to the U.S. in search of productivity-upping methods. Ever since the top brass of European industry, who toured the country in "Operation Impact" (CW, Mar. 1), went home, the operating levels have come for the detailed "know-how." American chemical manufacturers are showing the British team just how to run their plants to get the high rate of productivity for which the British

Fittings are important — from many standpoints. Cost, reliability, ease of assembly and life, to name a few. They're the stitches that hold your piping fabric together — that make it an efficient operating entity.

We sell fittings — not one type, but many. We do so because we know from experience that no one type is best suited for every job.

Immediately available from stock are seamless carbon steel welding fittings, up to 24 inch for use with standard, extra strong and double extra strong pipe. Also forged steel flanges.

For stainless pipe, we stock 18-8 screwed fittings, types 304 and 316, stainless welding fittings and flanges and light weight Speedline fittings for Schedule 5 stainless pipe.

Consult us about fittings. We want you to have the type best suited to your needs.

Our other products include Stainless and Carbon Steel Pipe, Boiler and Pressure Tubes, Seamless Steel Mechanical Tubing. All types of Pipe and Tube Fabrication.

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Aluminum Addition

FIRST-OFF-THE-LINE ALUMINUM PIGS are poured at Alcoa's Point Comfort works (near Port Lavaca, Tex.) by Samuel W. Anderson (left), deputy administrator of the Defense Production Administration, and Frank L. Magee, Alcoa VP and general production manager. The ceremony marked beginning of production of one of two units at Point Comfort, each capable of producing 35 million pounds of aluminum annually. Alcoa is also completing another smelting plant near Rockdale, Tex.

are striving in their own chemical industry.

The group (sponsored by the Anglo-American Council on Productivity and the Mutual Security Agency—a successor to ECA), unlike "Impact," consists of the actual operating personnel. In the main it consists of works managers and labor-management people.

Productivity the Crux: Productivity factors rather than technical processes are the keynote of the tour. Among the areas being covered are factory and plant layout, construction materials for plants, instrumentation and automatic controls, mechanical handling of materials, treatment and disposal of effluents, standardization of equipment and products, organization of plant maintenance, supervision and cost control, safety and welfare, and management-labor relations. All of these are areas which the industrial leaders on the "Impact" tour considered to be a large part of the secret of American productivity.

Beginning with Merck at Rahway and ending with Du Pont at Wilmington, the Britishers are visiting several large and medium-sized chemical companies in the country. Covering twelve states from New York to Texas, the tour will last six weeks, has already taken in the American Institute of Chemical Engineers convention at Atlanta.

Louisiana Beckons

Last week the Louisiana State Board of Commerce and Industry granted ten-year tax exemptions on construction projects totaling $42 million; and chemical companies received the lion's share—over $26 million.

Established in 1936, and renewed in 1946, the state policy to encourage capital investment there through tax exemptions is apparently a success. For since 1946, chemical process industries have invested over $685 million in facilities which have received this tax benefit.

In the latest exemptions, Commercial Solvents got the nod for the largest, its $13 million ammonia-methanol expansion at Sterlington. Davision Chemical received a $7,750,000 exemption for its Lake Charles catalyst plant.

Other major exemptions included: Morton Salt's catalyst plant at Weeks Island ($1,970,179); Naugatuck Chemical's Baton Rouge synthetic rubber expansion ($1.5 million); Oronite's lube additives expansion in Plaquemines Parish ($1,190,000); General Chemical at Marrero ($253,000); and International Paper, Bastrop, two projects ($266,700 and $158,502).

How It Works: To qualify for tax exemption, a manufacturer outlines in an application to the Board of Com-

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Gum Arabic:

cleaned amber sorts, crushed, grained & powdered — USP & technical. Iscosol grade for quick wetting.

Gum Karaya:

sorts, crystals, & powdered — NF & technical.

Locust Bean Gum:

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Yes, Isco gums are widely used in the confectionery trade and in countless other industries where they have proved invaluable as adhesives, thickeners, sizings, stabilizers and stiffeners.

Isco employs new equipment, new milling procedures and new refining techniques to produce exceptionally fine gums for industry.

Among the latest Isco developments are Iscolized Gums — readily dispersible versions of Arabic, Karaya, Tragacanth and Locust Bean which enable users to make up solutions rapidly, and eliminate presoaking.

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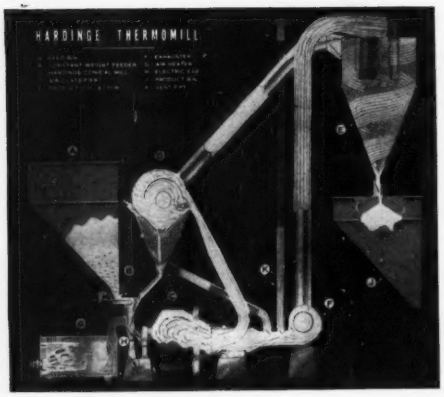

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merce and Industry the types of structures he will erect, the approximate cost and the location. The board reviews the application, grants a five-year tax exemption if all is in order. At the end of this term, the manufacturer may apply for a second five-year exemption.

Exemptions are granted on all buildings and machinery, but not on land required for the plant site. Cost of materials essential to a process but not consumed therein—such as heat transfer media, or solvent that is recovered for reuse—is exempt, but raw materials and finished products do not enjoy such exemption from taxes.

Quid Pro Quid: The applicant, in turn, agrees to employ Louisiana residents and to contract with local firms "wherever feasible and practicable" for the construction and operation of his plant.

There are also a few gimmicks in the contractural obligations which give the board some discretional power. For instance, it may rule on where a plant is to be located. Further, no plant may be built in any locality where a similar manufacturer has been established, except with his written consent. And one of the biggest sticks the board holds, is its right to decide on whether an applicant has been abiding by the terms of the contract in the initial exemption period, and whether he should receive the five-year renewal.

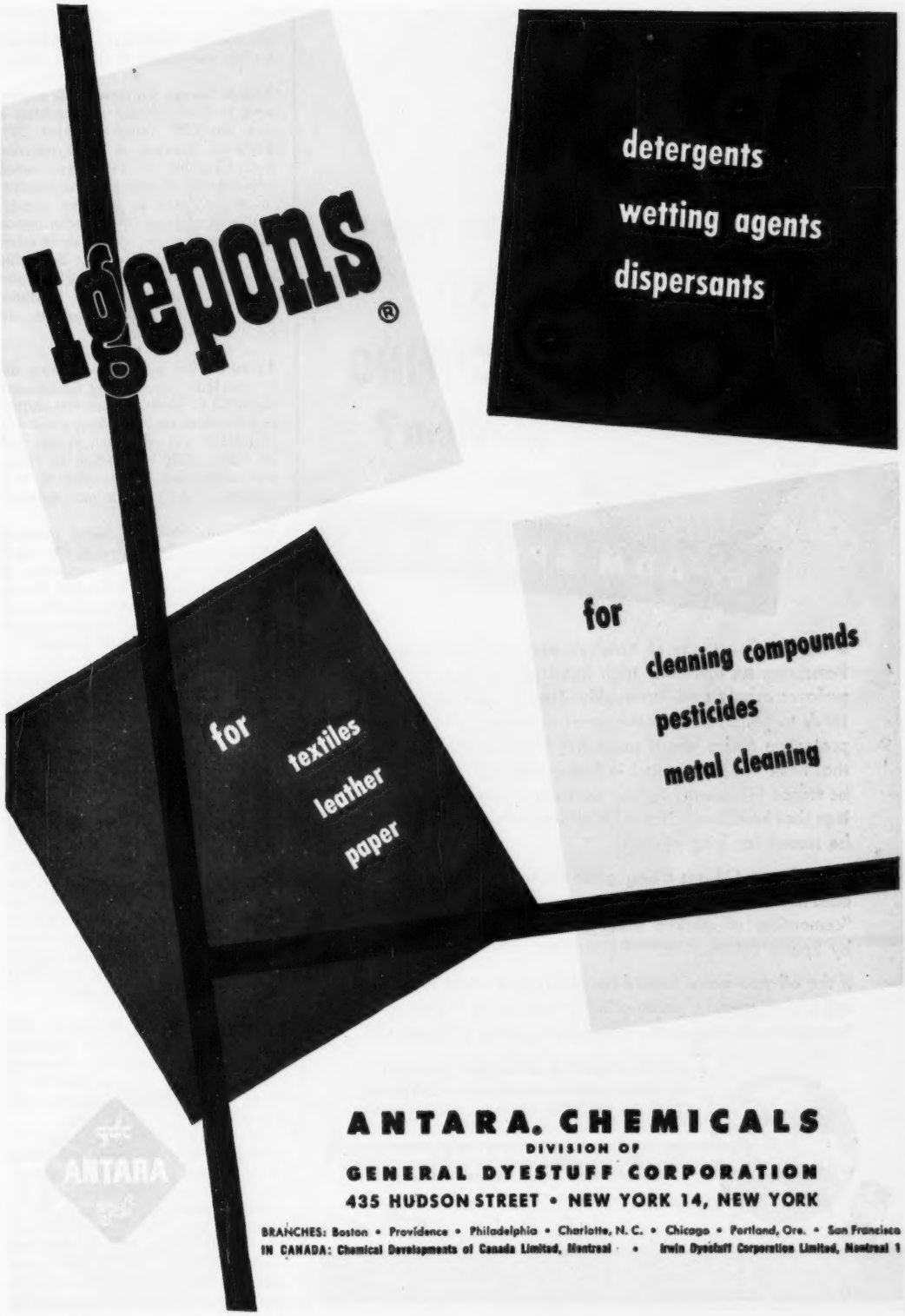
Though the tax exemption program certainly hasn't discouraged industry, it can't be credited entirely with the tremendous growth the state has experienced in the last five-six years. For Louisiana's low-cost fuel and plentiful chemical raw materials too (*CW, Mar. 22*) are powerful incentives to a chemical manufacturer seeking a plant site.

COMPANIES . . .

Natural Gas Odorizing Co., Inc., stock has been purchased by American Research and Development Corp., Boston. The Houston, Tex., company (*CW, Aug. 11, '51*) makes mercaptans and other odorants used in treating natural gas. Present officials will continue in their jobs, and ARD's funds will enable a plant expansion to triple capacity from the present estimated million pounds per year.

•

International Paper's protection of chlorine supply during 1951 took a rather tangible turn. It bought $2 million in 4% notes from Mathieson Alabama (which is putting up a chlorine plant near McIntosh, Ala.), and has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● Sperm Oil is one of nature's best anti-rust materials. Possessing an unusually high film strength, it coats metal surfaces evenly and thoroughly. Furthermore, Sperm Oil tends to penetrate into the pores of metals, giving better protection and a longer protective life. Heat-treated parts that have been quenched in Sperm Oil, for example, can be stored for months without showing signs of rust. Stampings that have been Sperm Oil dipped or sprayed can also be stored for long periods.

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set aside an additional $8,491,616 for further investment in the 4% notes.

●

Atomic Energy Commission is continuing to have trouble in acquiring a new site (*CW Newsletter, Mar. 29*). Eighteen directors of the Louisville, Ky., Chamber of Commerce voted unanimously in opposition to location of an AEC site in Jefferson county, northeast of Louisville. Similar action has been taken by a number of other nearby towns. Besides the Louisville area, other locations said to be under AEC consideration include Madison, Ind., and other southern Indiana and Ohio points.

●

Union Oil has joined the growing list of petroleum firms setting up separate chemical divisions. Union has shifted responsibility for manufacture and sale of methyl and ethyl mercaptans and its forthcoming production of sulfur and ammonium sulfate (all at Wilmington, Calif.) to the new division.

●

Ferro/Horizons: If present titanium pilot-planting operations at Cleveland are successful, look for expansion of Ferro operations at Nashville, Tenn., to include titanium metal powder production. In addition to structural uses, the titanium would find its way into chemical catalysts.

• Incidentally, Horizons is reported to have a new major stockholder: Laurance Rockefeller, who has shown his interest in non-ferrous metals through his directorship of International Nickel. Horizon's Princeton, N.J., office will neither confirm nor deny the report.

●

Howard and Sons Ltd., of Ilford, Great Britain, has formed a Canadian subsidiary, Howard and Sons (Canada) Ltd. The company will set up a plant in Cornwall, Ontario, to make solvents, plasticizers and other chemicals, expects to begin production on a limited scale in 1953. Cornwall was selected as the site because of the availability of hydrogen from CIL's plant.

●

Edwal Laboratories (Ringwood, Ill.) has received funds for expansion of photographic and fine chemicals through the sale of a substantial interest in the company to Morton Salt, Chicago.

●

Aluminum Co. of Canada, subsidiary of Aluminum Ltd., has filed a statement with the Securities and Exchange Commission reporting that it plans to raise $90 million in construction money during 1952. Of this, $60 million would cover increased costs and new projects not included in Alcan's expansion program planned last

full speed ahead

Our expanding defense and civilian needs continue to put ever-increasing demands upon the Chemical Industry. Stauffer is responding to this challenge by upping production on its whole line of basic chemicals.

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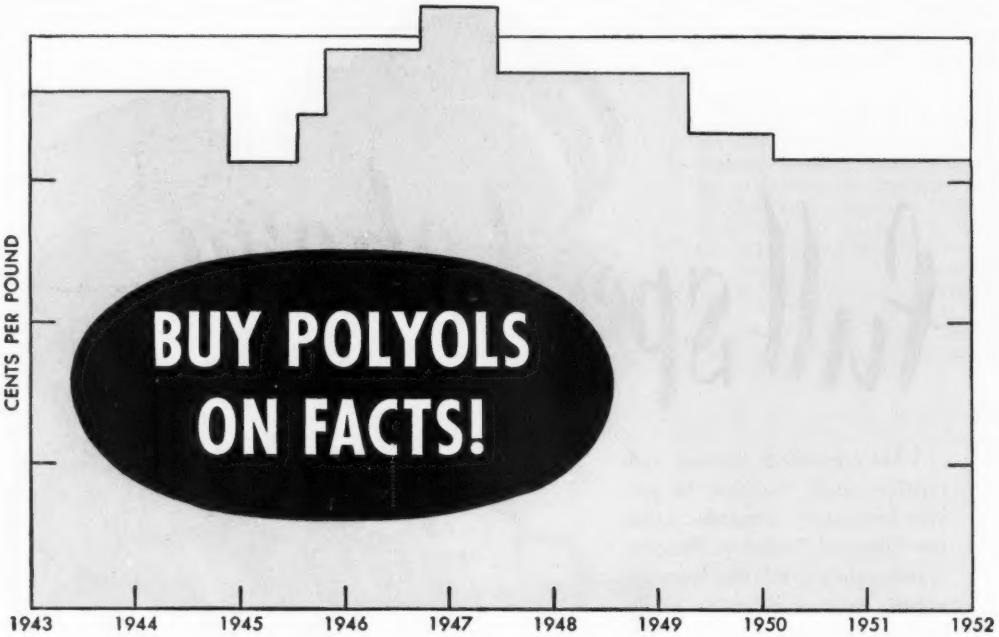

FACT No. 1 . . . ***Price and Price Stability***

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FACT No. 2 . . . ***Performance***

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FACT No. 3 . . . ***Availability***

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fall. Method of financing has not as yet been finalized.

•

Beckman Instruments, Inc.: A total of 371,553 shares of stock are now on sale at $12½ apiece. Proceeds from 75,000 shares will go to company general funds, other proceeds will go to stockholders who are selling these shares.

•

Minnesota Mining & Manufacturing: Sale of 300,000 shares of common stock is planned, according to a registration statement filed with the SEC. W. L. McKnight, 3M board chairman, is selling 20% of family holdings to avoid sale at a loss upon death to meet inheritance tax needs. McKnight will still be the company's largest stockholder.

FOREIGN. . . . . .

Spain: The Spanish Instituto Nacional de Industria is releasing production figures—both actual and potential—for the 27 diverse enterprises it controls. They indicate an upswing in the nation's industrial development.

Some of figures given out: Of crude oil, INI refineries of Escombreras (of which Caltex owns 25%) produced 354,674 metric tons in 1951, anticipates an output of 750,000 tons for 1952 and 1,400,000 tons in 1953. Of aluminum, INI's ENASA plant in Valladolid produced 4,250 tons in 1951, hopes for 7,500 tons in 1953. Moreover, by 1953 Spain plans to hike the power production figure to 8,950 million KWH, 1,400 million of which is to be furnished by INI plants. Last year Spain produced 8,500 million KWH.

•

Nylon: Du Pont has granted nylon licenses to seven West German concerns and is negotiating at present with an eighth firm. The desire of the German firms for American licenses was a surprise twist—German Perlon has successfully beat out nylon competition on the domestic market. Reason for the move, however, lies in the commercial and technical factors (admixtures) involved.

•

Chemical Conference: The 25th Congres Internationale de Chimie Industrielle, to be held in Frankfurt, Germany, from May 18-25 in conjunction with the Exhibition of Chemical Apparatus, has already received some 5,000 applications from prospective participants. Technical associations from the various European countries (including Germany) will be represented at the international conference, where experts will discuss latest developments in techniques and chemical apparatus.

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CORROSION

CHEMICAL RESISTANCE OF "KARBATE" PRODUCTS

This table shows the grade of "Karbate" Impervious Graphite and the type of "National" Resin Base Cement recommended for commercial use in the more common corrosive chemicals. The concentrations and temperatures listed are based on field and laboratory experience, but *the satisfactory use of these materials is not limited to the chemical reagents or conditions shown in this table.*

Chemical Reagent	Concentration	Fluid Temperatures up to	Recommendation Grade	Recommendation Cement
ACIDS				
Acetic acid	All	Boiling	22	14
Acetic anhydride	100%	Boiling	22	14
Arsenic acid	All	Boiling	22	14
Boric acid	All	Boiling	22	14
Carbonic acid		200° F	22	14
Chromium trioxide, aq. soln.	0-10%	Boiling	22	14
Citric acid	All	Boiling	22	14
Formic acid	All	Boiling	22	14
Hydrobromic acid	All	Boiling	22	14
Hydrochloric acid	All	Boiling	22	14
Hydrofluoric acid	0-48%	185° F	x	
Hydrofluoric acid	48-60%	—	22	14
Hydrofluoric acid	Over 60%	Boiling	22	14
Hydrofluoric acid	All	Boiling	22	14
Hydrogen sulphide-water	All	212° F	22	(†)
Lactic acid	100%	185° F	22	(†)
Monochloracetic acid	0-10%	140° F	22	
Nitric acid	10-20%	—	x	
Nitric acid	Over 20%	Boiling	22	14
Nitric acid	100%	Boiling	22	14
Oleic acid	All	Boiling	22	14
Oxalic acid	0-85%	Boiling	21	14
Phosphoric acid	100%	Boiling	22	14
Stearic acid	0-75%	Boiling	22	(†)
Sulfuric acid	75-96%	338° F	x	
Sulfuric acid	Over 96%	—	22	14
Sulfuric acid	All	Room	22	14
Sulfurous acid	All	Boiling		
Tartaric acid				
ALKALIES				
Ammonium hydroxide	All	Boiling	22	15
Monathanolamine	All	Boiling	22	15
Sodium hydroxide	0-67%	Boiling	21	15
Sodium hydroxide	67-80%	275° F	21	15
Tetramine C	All	Boiling	21	15
SALT SOLUTIONS				
Aluminum Chloride	All	Boiling	22	14
Ammonium thiocyanate	0-63%	Boiling	22	x
Arsenic trichloride	100%	230° F	22	14
Calcium chlorate	0-10%	140° F	22	14
Calcium hypochlorite	All	90 °F	22	14
Cupric chloride	All	Boiling	22	14
Ferric chloride	All	Boiling	22	14
Ferrous chloride	All	Boiling	22	14
Ferrous sulphate	All	Boiling	22	14
Manganous sulphate	All	Boiling	22	14
Nickel chloride	All	Boiling	22	14
Nickel sulphate	100%	Boiling	22	14
Phosphorus trichloride	All	Room	21	—
Sodium chloride	0- 4%	Boiling	22	14
Sodium chlorite	0-25%	Boiling	22	14
Sodium hypochlorite	All	Boiling	22	14
Stannic chloride	All	Boiling	22	14
Zinc ammonium chloride	All	Boiling	22	14
Zinc chloride	All			
Zinc sulfate				
HALOGENS, AIR, WATER				
Air	—	338° F	22	14
Bromine	100%	Room	x	
Bromine water	All	Room	22	14
Chlorine—dry	100%	Room	22	14
Chlorine water	All		x	14
Iodine	100%		x	
Fluorine	100%			

Chemical Reagent	Concentration	Fluid Temperatures up to	Recommendation Grade	Recommendation Cement
HALOGENS, AIR, WATER cont.				
Steam	—	338° F	22	14
Water	—	Boiling	22	14
ORGANIC COMPOUNDS				
Acetone	0-100%	Boiling	22	14
Amyl alcohol	100%	Boiling	22	14
Aniline	100%	338° F	22	14
Aniline hydrochloride	0-60%	Boiling	22	14
Benzene	100%	212° F	22	14
Benzene hexachloride	100%	Boiling	22	14
Butyl alcohol	0-100%	Boiling	22	14
Butyl "Cellosalve"*	100%	Boiling	22	14
Carbon tetrachloride	0-100%	257° F	21	14
"Cellosalve"*	100%	Boiling	22	14
Chlorethylbenzene	100%	140° F	22	14
Chloroform	—	338° F	22	14
Deoxidine	100%	Boiling	22	14
Dowtherm	0-100%	Boiling	22	14
Dioxan	0-100%	122° F	22	14
Ethyl alcohol	0-8%	200° F	22	14
Ethylene chlorohydrin	100%	Boiling	22	14
Ethylene dibromide	100%	Boiling	22	14
Ethylene dichloride	Saturated	Room	22	14
Ethyl mercaptan—water	100%	Boiling	22	14
Freon 11 and 12	100%	338° F	22	14
Gasoline	0-100%	Boiling	22	14
Glycerine	100%	Boiling	22	14
Isopropyl acetate	0-100%	Boiling	22	14
Isopropyl alcohol	100%	Boiling	22	14
Isopropyl ether	100%	Boiling	22	14
Kerosene	All	Boiling	22	14
Mannitol	100%	Boiling	22	14
Methyl isobutyl ketone	0-100%	Boiling	22	15
Methyl alcohol	100%	Boiling	22	14
Monochlor benzene	100%	Boiling	22	14
Octyl alcohol	100%	Boiling	22	14
Paradichlorbenzene	100%	Boiling	22	
Paraldehyde	100%	Boiling		
Tetrachlorethane, sym.	100%			
Trichlorethylene				
MIXTURES				
Ammonium persulfate plus sulfuric acid	25%	Room	22	14
Calcium chloride plus calcium chlorate	20%	140° F	22	14
Chloronated ethyl alcohols	30%	Boiling	22	15
Chrome plating solns.	10%		x	
Hydrochloric acid sat. with chlorine	All	Boiling	22	14
Nickel plating solns. (chloride)	Over 20%			
Nickel plating solns. (sulfate)	All	Boiling	22	14
Nitric acid plus hydrofluoric acid	All		22	(†)
Oakite acid materials—O.C. 32, O.C. 33, O.C. 36, O.C. 84A, O.C. 84M, CRYS. 87, O.C. 88	15%	Boiling	22	14
Parkerizing solution	5%	140° F	22	14
Rayon Spin bath	All	Boiling	22	14
Sodium hypochlorite plus sodium hydroxide	All	Boiling	22	14
Sulfuric acid plus nitric acid	0-25%	Boiling	21	—
	96%		x	
	.03%			

(x) Not recommended

NOTE: (†) "National" No. 14 Cement used with threaded joints will give serviceable life.
(*) The term "Cellosalve" is a registered trade-mark of Union Carbide and Carbon Corporation.

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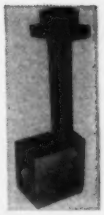

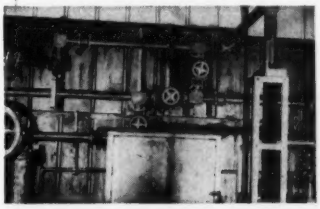

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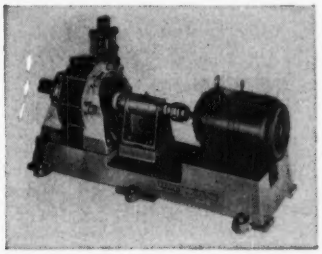

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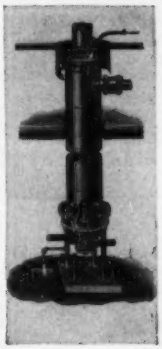

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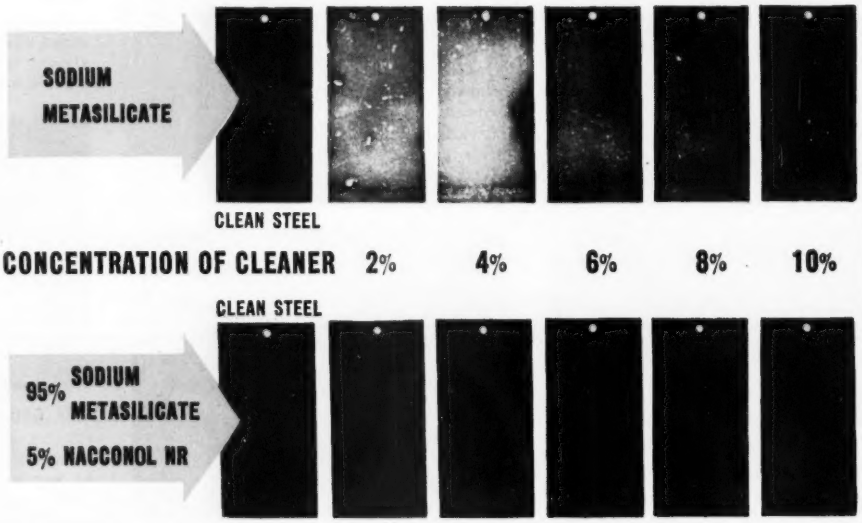
About "Luminograms"

Test panels shown here were coated with mineral oil and then immersed in the cleaning solutions at 140° F for 10 minutes. When photographed under ultra-violet light, fluorescent oil residues invisible to the naked eye show clearly as white or grey areas, in proportion to the amount of oil residue on the panel. A perfectly clean panel, obviously, photographs black under ultra-violet light.

REMOVAL OF MINERAL OIL FROM STEEL
10 MINUTE IMMERSION AT 140° F



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KEY CHANGES . .

Alexander I. Newman: From executive vice president, Precision Scientific Co. to president, Laboratory Industries, Inc.

William H. Roberts, Jr.: To vice president, Glyco Products Co., Inc.

Elmer F. Hinner: To director, Hercules Powder Co.

Paul Mayfield: To director, Hercules Powder Co.

S. Sydney Minault: To director, Tracerlab, Inc.

Robert G. Millar: To director, Tracerlab, Inc.

Ford W. Wieder: To director, Chemical Process Co. He is vice president of Stauffer Chemical Co.

J. A. Sherred: To development director, Texas div., Monsanto Chemical Co.

George W. Walther: To general superintendent of chemical operations, Neville Island plant, Pittsburgh Coke & Chemical Co.

Rollin F. Conaway: From assistant plant manager, Spruance plant, to manager, rayon plant of Yerke Works, E. I. du Pont de Nemours & Co.

Richard C. Ruffer: From production superintendent to manager, Valdosta, Georgia plant, American Cyanamid Co.

Ernest T. Lindsey: To manager, Bishop, Tex. plant, Celanese Corp. of America.

J. Ernest Miller: From plant manager, RFC synthetic rubber plant to assistant to chief, RFC synthetic rubber div.

Allen Latham, Jr.: To vice president, Arthur D. Little, Inc. He is also technical director of the Mechanical div.

Harvey P. Hood: To director, International Paper Co. He is president of H. P. Hood & Sons.

John M. Kingsley: To director, International Paper Co.

E. C. Gillett: From chief chemist to technical director, The California and Hawaiian Sugar Refining Corp.

Howard W. Swank: From nylon technical manager to production manager, "Dacron" div., E. I. du Pont de Nemours & Co.

James W. Hutchinson: From superintendent, Jones Mill plant, to general manager, aluminum reduction plant, Arkadelphia, Ark., Reynolds Metals Co.

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ANSPON (left) AND HASS: For supersonic speeds, a transparent sheet.

Plastic With a Purpose

The wraps are off Gafite, General Aniline and Film Corp.'s first commercial, finished plastic.

It's a thermoplastic polymer of methyl α-chloroacrylate, slated for service in military aircraft manufacture.

Research, aimed at civilian applications, is now under way at GAF's central research laboratories, Easton, Pa.

General Aniline and Film Corp., a front-runner in development of acetylenic raw materials, has now perfected an expensive but uniquely useful plastic of its own. Its entry: Gafite, a new, transparent thermoplastic polymer of methyl α-chloroacrylate.

The aircraft industry will have first call on Gafite and here's why: Its relatively high softening point—138 C compared to 78 C for related materials like Lucite and Plexiglas—answers a pressing need for a shatterproof glazing plastic that stands up to the skin-heats of planes operating at supersonic speeds.

Heat resistance isn't all Gafite has has to offer. It's harder than most commercial, transparent plastics and has the same refractive index as optical glass. Fire resistance also is good; methyl α-chloroacrylate will burn in contact with an open flame, but even then, combustion is retarded by the liberation of hydrogen chloride gas.

International Problem: Methyl α-chloroacrylate is not entirely new to industrial polymer researchers. Its properties and possibilities were realized for a number of years, both in this country and abroad. Several companies (Du Pont, Imperial Chemical Industries among others) took a crack at developing the material with little more than a string of unremunerative patents and additions to the literature to show for their efforts.

A workable process for making methyl α-chloroacrylate wasn't hard to dope out. ICI put its faith in a synthesis starting with trichloroethylene, formaldehyde, methanol and sulfuric acid; GAF reacts methyl acrylate with chlorine, then splits out hydrogen chloride.

The headache was in processing the resin. When heated to the forming temperature, it would discolor. And more often than not, surface pimples formed on the plastic upon cooling. GAF research group leader Harry Anspon had wrestled with the problem, on and off, for several years with varying degrees of success.

Focus from Above: But the need for an early solution was brought into sharp focus by the rearmament program. GAF president Jack Frye, a pioneer* of America's commercial air industry and still a familiar figure in the aviation world, learned that the Air Force was looking for a new and better glazing material for the cockpit canopies of jet fighters.

Frye brought the problem home to the company's central research laboratories, Easton, Pa. Methyl α-chloroacrylate, already in the house, was taken off the shelf as the most promising potential solution. Spurred by the interest and attention of research director Henry Hass, Anspon and his group redoubled their efforts, finally met with success. In all, five years of research went into the development of the new polymer; the final stages under government auspices.

GAF puts the finger on impurities as one of the major causes of its erstwhile processing woes; dust picked up from the air is enough to discolor and otherwise foul the finished plastic.

Into the Stretch: The last big developmental barrier apparently has been hurdled. The company tells CHEMICAL WEEK it can now produce the new plastic dependably. Just how economically, on the other hand, is still a matter of conjecture, but it's fairly certain that cost won't stand in the way of the product's special military assignment. Competition in civilian markets will be another story.

Sheets of the new plastic are now getting the once-over at Wright-Patterson Air Force Base, Dayton, O. But GAF isn't putting all of Gafite's eggs in the Air Force's basket. Research slanted toward new uses continues.

Now in the works: development of the plastic's foaming properties (it releases equal volumes of methyl chloride and hydrogen chloride when heated). The foamed plastic has a strong, cork-like structure, is getting more than a passing glance for its possibilities as a thermal insulator.

Ultra Ultramarine

A new ultramarine blue pigment has been developed by researchers of Interchemical Corp., New York, N.Y. It boasts twice the coloring power of the best previous commercial ultramarines, should find a market in printing inks and textile dyes.

Other probable outlets are in the manufacture of plastics, rubber, linoleum and soaps. The new pigment also shows promise of replacing blues made

* Partner in a flying school in 1923, four years before Lindbergh's epochal flight.

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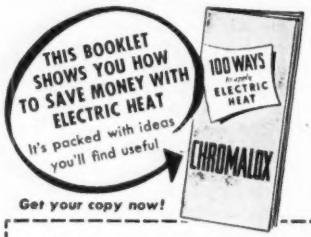
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Once made from lapis lazuli and worth its weight in gold to the ancients, ultramarine blue more recently has been produced by synthetic methods. But the gain in production efficiency is offset, in part, by a loss of vividness.

A crystalline pigment containing sulfur, aluminum and silicon compounds, the material is ordinarily made by heating a mixture of clay, sulfur, carbon and soda ash followed by another heat treatment with air and more sulfur. The product is a substance which closely resembles a zeolite in crystalline structure.

A Spark: This similarity sparked the imaginations of Interchemical's chemists. Why not use zeolites in place of the conventional clay and soda ash in the manufacturing process? Lacking a good reason against it, the scheme was tried. Result: the highly chromophoric new pigment.

The innovation paid off in more ways than one; process time was reduced from 14 to 4½ hours.

Bond of the Future

Vacuum deposition, a comparatively new technique for producing metal-to-metal bonds, is getting lots of attention at Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

Vacuum methods are being used in studies of adhesion of evaporated metal coatings and glass-to-metal seals.

Because of tough oxide coatings, some metals just can't be joined by conventional electroplating or soldering. But with high-vacuum deposition, the oxide is a blessing rather than a bane. Evaporated films of metals that form hard, adherent oxides stick tenaciously to their own and other oxides (glass included).

Briefly, here's how the vacuum coating procedure works: Vapors of the coating metal and the metal to be coated are interacted in a sort of simultaneous condensation to produce a gradual transition from metal to coating.

To coat titanium with copper, for example, titanium is evaporated until the first sign of condensation appears on the copper surface. At this point the evaporation of copper is begun. When the copper starts to condense, the titanium evaporation stops. Copper deposition continues until titanium no longer shows through the copper coat.

Practical Side: As far as applications of the process are concerned, Noel Scott, ERDL physicist, points out that vacuum deposition might be used to advantage in the production of aluminum-clad iron (as a substitute for nickel) anodes for vacuum tubes; mirror manufacture; and processes for applying heat-resistant coatings to metals.

•

Nitrate Reagent: A color test for nitrates is the implication of recent analytical research with N-(1-naphthyl)-ethylenediamine. Scottish investigators report that the reagent gives a distinct purple color with as little as 2.5 micrograms of nitrate nitrogen per milliliter. Nitrites also are amenable to the test.

•

Anesthetic Probe: Smith, Kline and French researchers have uncovered a new, potentially valuable group of drugs in the amino-alkoxy-isoquinolines. The compounds have good anesthetic properties, are reported to be relatively non-toxic.

•

Expansion: Completion of new laboratories at Madison, Wis. marks the expansion of Bjorksten Research Laboratories' mining and metallurgical division. Division projects on the fire are concerned with the flotation of low-grade iron ores and the use of radioactive tracer methods in the solution of mineral benefication problems. Work at the new facilities will supplement research at the firm's Chicago headquarters.

•

Benzidine Patent: The Du Pont Co. has been assigned a new patent (U.S. 2,587,861) for the preparation of benzidine sulfate from relatively pure benzidine hydrochloride.

•

Algae Beware: Blue-green algae, the common pond contaminant, have an enemy in 2,3-dichloronaphthoquinone; extremely small doses of the compound have been found useful in controlling the organisms. Researchers Skoog, Fitzgerald and Gerloff at the University of Wisconsin came upon the quinone in their search for a substitute for copper sulfate—the most widely used lake algaecide. Unlike copper sulfate, the new agent won't form toxic deposits in the bottom mud of lakes.

•

New Fluorochemicals: M. W. Kellogg Co. (New York, N.Y.) is out with a new line of Kel-F oils, waxes and greases. Stemming directly from the company's research on plasticizers for Kel-F molding powders, the new products are chemically inert, have good high-temperature properties and high electrical resistance. Potential uses: cable, transformer oils and other elec-

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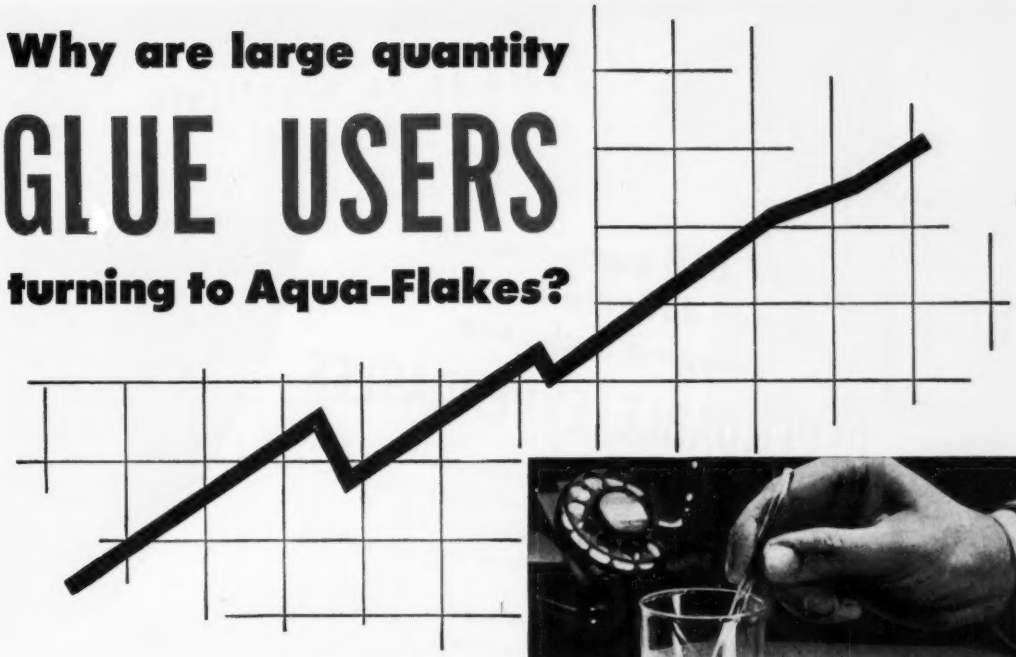

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Overseas Note: More than 100 nitrogen-substituted ethyleneimine derivatives were tested for their inhibitory activity by Imperial Chemical Industries investigators. The most effective compound was 2,4,6-tris-(ethyleneimino)-1,3,5-triazine. Where comparison was practical, pyrimidine derivatives proved more active than 1,3,5-triazines.

•

Concerted Effort: Late patent reports disclose substantial research activity in the field of quaternary pyrimidine salts and derivatives by Imperial Chemical Industries Ltd. Nine new patents (U.S. 2,585,905-06-09-10-17-35-36-72-79) dealing with these compounds have been assigned to the British company in the past several weeks.

•

Histamine Revamped: Scottish researchers of the University of Glasgow have worked out a new and cheaper histamine synthesis. Best known for its allergenic properties, histamine also is valuable in certain fields of medicine.

The recent commercial availability in Scotland of butynediol suggested the new approach.

Here's how it's done: The glycol is converted to the dichloride and reacted with potassium phthalimide in dimethyl formamide. Next comes hydration of the acetylenic bond with acetic acid and a mercuric sulfate catalyst. A nearly theoretical yield of 1,4-diphthalimidobutanone is obtained. Hydrolysis and condensation of the ketone with potassium thiocyanate gives 2-mercaptohistamine which is oxidized and treated with picric acid to yield histamine picrate.

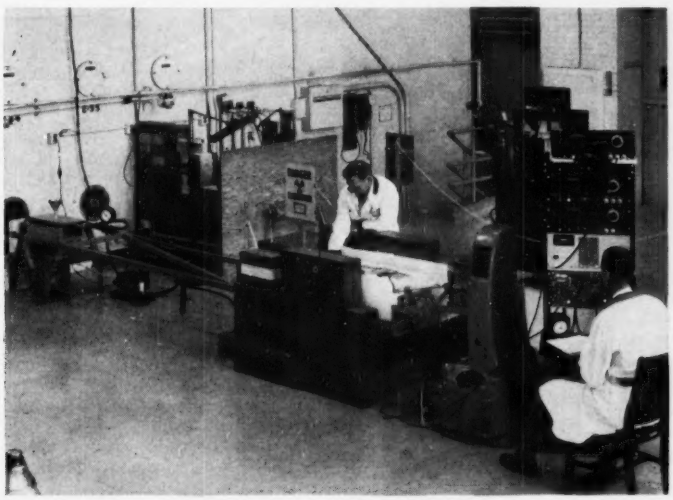
The relatively high (41%) over-all yield portends price reductions.

•

Eat it Up: An unlikely strain of phenol-destroying bacteria now commands the attention of Ohio State University researchers. Financed by a $10,000 Standard Oil Co. (Ohio) grant, the Ohio State group is probing the possibility of putting the bugs to work against phenol in petroleum refinery waste water.

•

Ideas Wanted: Chemical inventors will have their day in the sun at the upcoming Seventh National Chemical Exposition, Sept. 9 to 13. Exposition organizers are setting aside a special area in the Chicago Coliseum where a budding genius may introduce his personal brainstorm. Exhibit space for this purpose will be made available without cost. Stipulation: Commercial exhibits are out of bounds.



Neutrons on the Rebound

PHYSICISTS JOHN HARVEY AND MURRAY GOLDBERG (right) set up apparatus to reflect neutrons from mirrors of various materials. The scene: Brookhaven research reactor. The photo: one of the first released, showing heretofore restricted structural details of the reactor. What's happening: A beam of focused neutrons emerges from a slit (far left) in the reactor face, is reflected by a mirror close to the slit. Reflected neutrons are detected by counters inside the shielding (center); counts are recorded on the panel at right.

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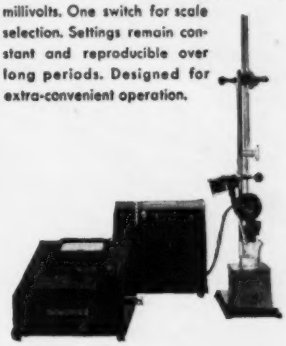

For complete information on this "Laboratory Team," write Dept. R. for Bulletin B-221 and B-223.

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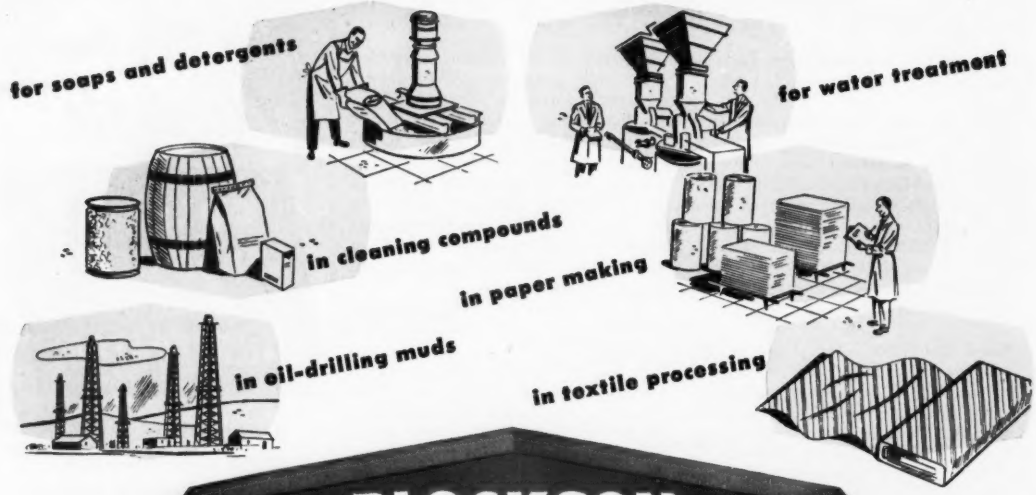

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- Sodium Polyphos (Sodium Hexametaphosphate) (Sodium Tetraphosphate)
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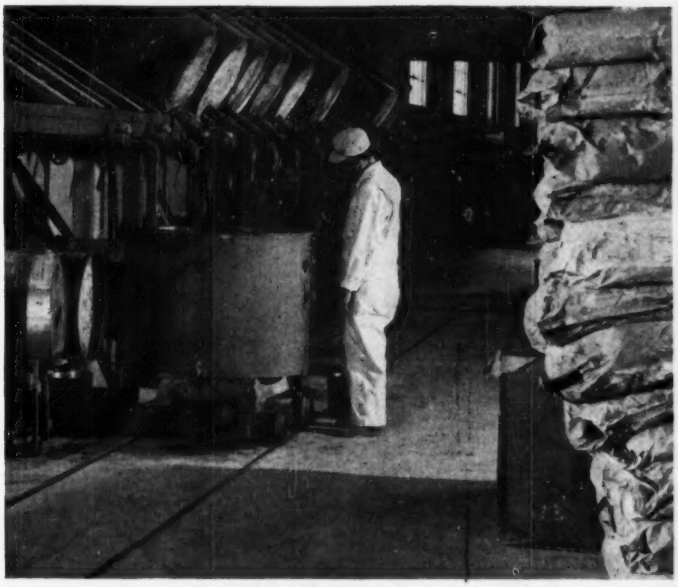
- Chlorinated Trisodium Phosphate
- Trisodium Phosphate, Monohydrate
- Disodium Phosphate, Anyhdrous
- Disodium Phosphate, Crystalline
- Monosodium Phosphate, Anhydrous
- Monosodium Phosphate, Monohydrate
- Sodium Acid Pyrophosphate
- Sodium Silicofluoride
- Sodium Fluoride
- Hygrade Fertilizer

BLOCKSON



RAW MATERIALS ARE TRANSFERRED DIRECTLY from storage to 125-gal. change cans. Cans move along on trackage and by overhead rail system. They substitute for the gravity feed of conventional paint plants.

One-Story Plant: More Efficient

If you can't spread out, go up. That's been the guiding principle of builders of American cities—the reason skyscrapers were born. And it's a logical, efficient solution to the problem of getting more office space or more living room in crowded cities. In the case of a chemical processing plant, however, the taller, slimmer building is not always the answer.

At least that's the view taken by officials of Sillers Paint & Varnish Co. (Los Angeles). For when they decided to put up a new plant, they sought a location with plenty of ground space, forsook conventional paint plant design and settled on a single-level production line in a one-story building.*

To prove their point was valid, officials estimate a savings of almost 50% on construction costs for the $400,000 unit. Moreover, the new one has only twice the floor space of the old, but is turning out four times as much paint. And though the equipment used is generally similar, machine-hour productivity has risen by 60%.

Up or Out: The conventional paint plant is built on four levels (either full stories or balconies) to take advantage of gravity flow. Raw materials from storage are piped or lifted by

PRE-MIXERS in the storage area reduce volume, mean significant savings in bulk of material to be processed.

* Pittsburgh Plate Glass was probably the first to put up a single-story paint plant when it built its new one at Torrance (Calif.). Design of the PPG plant (*CIW, May 26, '51*), however, varies significantly from Sillers.

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3 MINIMUM FLOOR SPACE required . . . Standard model occupies 28 sq. ft.

4 LOW POWER COSTS—one H.P. motor drives standard model.

5 PLUGGING OF SCREENS ELIMINATED when cloth screens and mechanical vibrators are used.

6 NOISE AND VIBRATION REDUCED to a minimum through elimination of eccentric and shaft.

7 COMPLETE DUST-PROOFING easy and economical.

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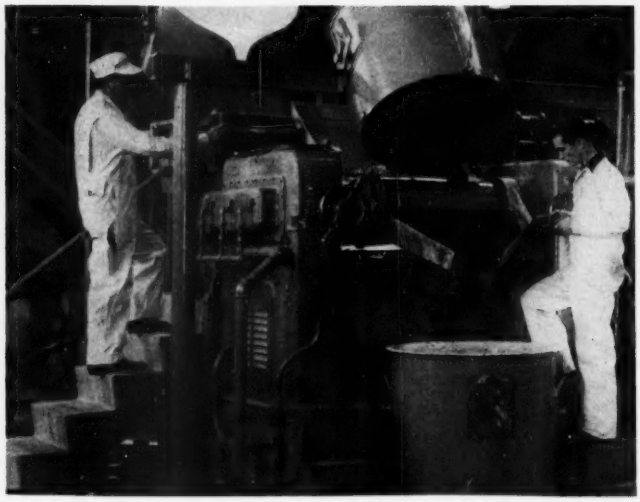


ROLLER MILL RECEIVES MIX from cans that are carried to the spot on overhead rail. Cans are tilted mechanically to give continuous feed. If re-milling is necessary, the feeding and receiving cans are simply interchanged.

. . . and Cheaper to Build

elevator to the fourth level. Next they are dropped to the third level for mixing, then to the second for milling. Finally, the material is returned to the ground level for packaging. The trouble with that method, says Sillers, is that floor space needed for each of the four operations is not the same and the arrangement of equipment is a compromise between efficiency and available floor space.

In the Sillers plant, raw materials arrive on one side of the building; liquids are pumped to one of fourteen storage tanks; dry materials, in bags, are moved to the storage area by fork trucks. Both liquids and dry materials are transferred directly from storage to 125-gal. change cans which move along by a system of trackage and an overhead monorail.

In the change can, the batch of material to be processed is transferred to one of the two pre-mixers in the storage area. Each pre-mixer is equipped with special ventilating facilities to remove 1,100 cu. ft. of air a minute. Pre-mixing reduces the dry ingredients to about one-fourth their former volume, means a significant over-all reduction in the bulk of materials that are processed, says Sillers. Based on experience in the old plant, officials estimate that processing volume per unit of product is cut by 48%.

From the pre-mixer, the can of material is then carried into the factory area for milling, tinting and packaging. There cans are hoisted high enough to permit flow, tilted mechanically to pour contents into the mill. If re-milling is necessary, the feeding and changing cans are merely interchanged and the process continues through another cycle.

If the product requires tinting, it is taken to a battery of six tinting mixers. In either case, the finished material is pumped into storage tanks elevated about eight ft. above the floor level. From the storage tanks, it is fed to a line of automatic filling and capping machines, and an automatic labeller. Packaged products are stored for shipment in a 33,000-sq.-ft. finished goods area. An adjacent loading dock accommodates four trucks at a time to carry the cans to dealers.

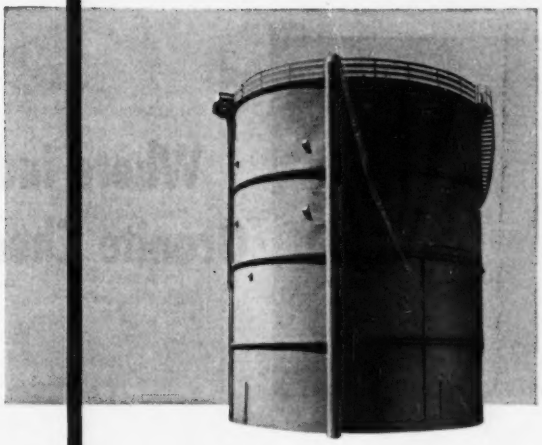
Switch to Nitric?

Substitution of nitric acid for sulfuric in the acidulation of rock phosphate is either inevitable or impractical depending on which expert happens to be talking at the moment. But recent interest in the idea is now heightened by the disclosure of Major General Bill Porter (president, Chemical Construction Corp.) that his company has a nitric-phosphate process in the pilot stage.

The idea of using nitric instead of sulfuric acid in phosphate production is, of course, not new. Several Continental companies are doing it com-

simpler

The Wiggins Gasholder has a remarkably simple design. It has none of the complicated mechanisms of old-type gasholders. No materials that can be harmed by weather.



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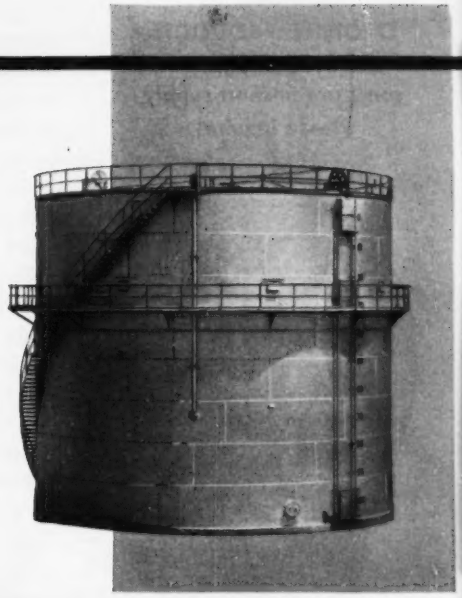
Wiggins is the ONLY gasholder that uses no water, no tar, no grease. Wiggins assures no weather worries, no operating costs, no maintenance problems.



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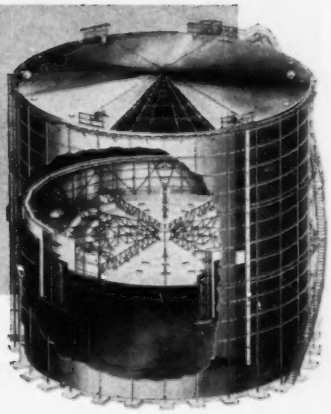

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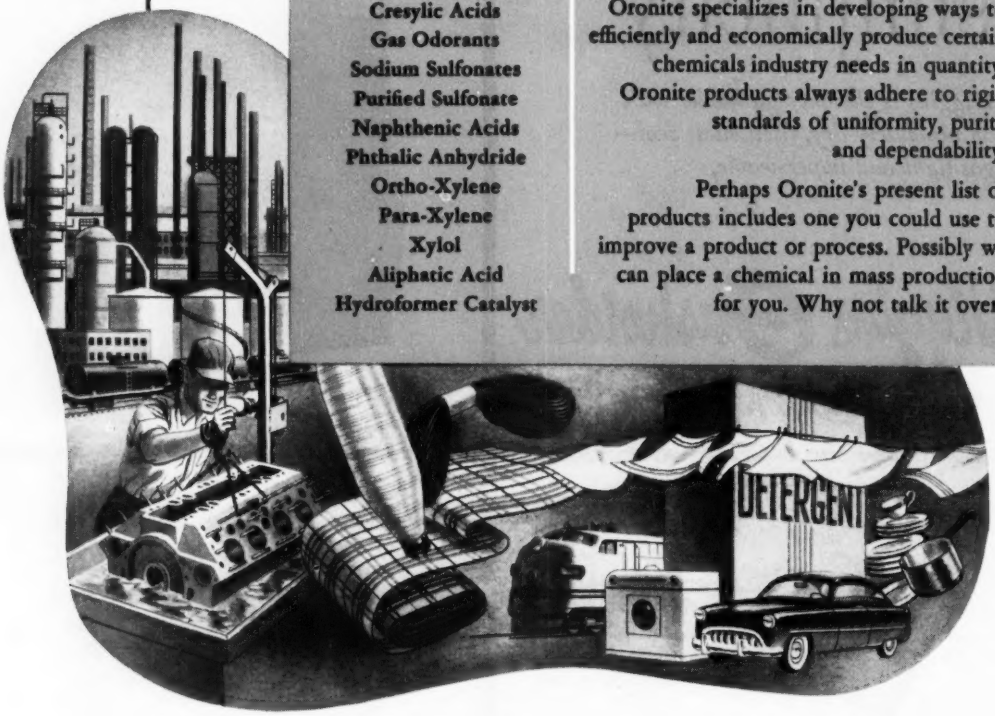

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2339

mercially* and Imperial Chemical Industries, in England, is pilot-planting a process.

In this country, the TVA, with a long-standing interest in the project, has been operating a four-ton-a-day pilot unit, plans a 50,000-ton-a-year plant for next year if, by that time, nobody else has decided to give the process a full-scale trial. Mathieson Chemical, in cooperation with the U.S. Department of Agriculture, is currently evaluating the idea. (*CW, Oct. 16*).

Conservative and Cheap: Big reason for the interest in the process in the U. S. is the sulfur savings that would result. But aside from other considerations, TVA maintains that for producers with captive ammonia and nitric acid facilities, phosphate production using nitric acid would be more economical. And, theoretically at least,

GENERAL PORTER: Salt regeneration provides the clue.

the substitution is simple: nitric is merely used instead of sulfuric.

In practice, however, it doesn't work out quite so easily; fertilizer technology would have to be completely revamped. Furthermore, straight use of nitric acid results in the formation of large quantities of calcium nitrate, which makes the product commercially undesirable. Two of the European companies separate out the calcium nitrate, sell it as a by-product. But TVA questioned the economies of the separation as well as the market value of the by-product in this country. Instead it sought other means of getting rid of the material, came up with four processes:

- Phosphate is extracted from the rock by a mixture of nitric and phosphoric acids. This is followed by ammoniation, addition of potassium chloride and drying. Phosphoric acid requirements are a third those for ordinary manufacture of triple superphosphate.
- The second process is similar to the first except that acidulation is accomplished by a mixture of sulfuric and nitric acids. Sulfuric needs are about half those of superphosphate production. Both processes using mixed acids for acidulation have been tested in the TVA pilot plant.
- The third process is similar to the second except that acidulation is carried out by straight nitric acid and the needed sulfate is supplied by addition of potassium sulfate.
- Acidulation is carried out with straight nitric acid as in the third process. Ammoniation precipitates out dicalcium phosphate and calcium fluoride, which are filtered off. The filtrate is treated with carbon monoxide and ammonia; calcium carbonate precipitates and is filtered off. Solid ammonium nitrate is produced from the filtrate by evaporation and crystallization, graining or prilling.

Chemico's Porter is not yet willing to talk about the nature of the process his company is working on. He does say that acidulation is carried out with straight nitric acid and that "the moderate amount of sulfuric salt necessary in one phase of the operation is regenerated so that it can be used over and over." That would mean, in all probability, that the company's process is a variation of an I.C.I. process involving acidulation with nitric, using ammonium sulfate as the sulfuric salt that is regenerated.

* E.g., Norsk Hydro (Norway), Dutch State Mines, I. G. Farbenindustrie (Germany), Societe Potasse et Engrais Chimique (France).

Stepping It Up

John R. Hoover, president of B. F. Goodrich Chemical Co., reported last week that his company has been able to boost output of cold GR-S synthetic rubber by 30% without any increase in plant facilities. The key: addition of a sequestering agent (a tetra-sodium salt of ethylenediamine tetra-acetate) to the water used in making up the latex.

The sequestering agent ties up ions of iron, calcium and magnesium (commonly found in the water) so they can't be precipitated by ordinary means. Apparently it prevents decomposition, coagulation, sludge formation and putrefaction in the latex; makes for a cleaner, faster reaction. Hoover points out that reaction time has been cut from thirteen hours to approximately nine, and that costs have been lowered because of a reduction in the amount of auxiliary

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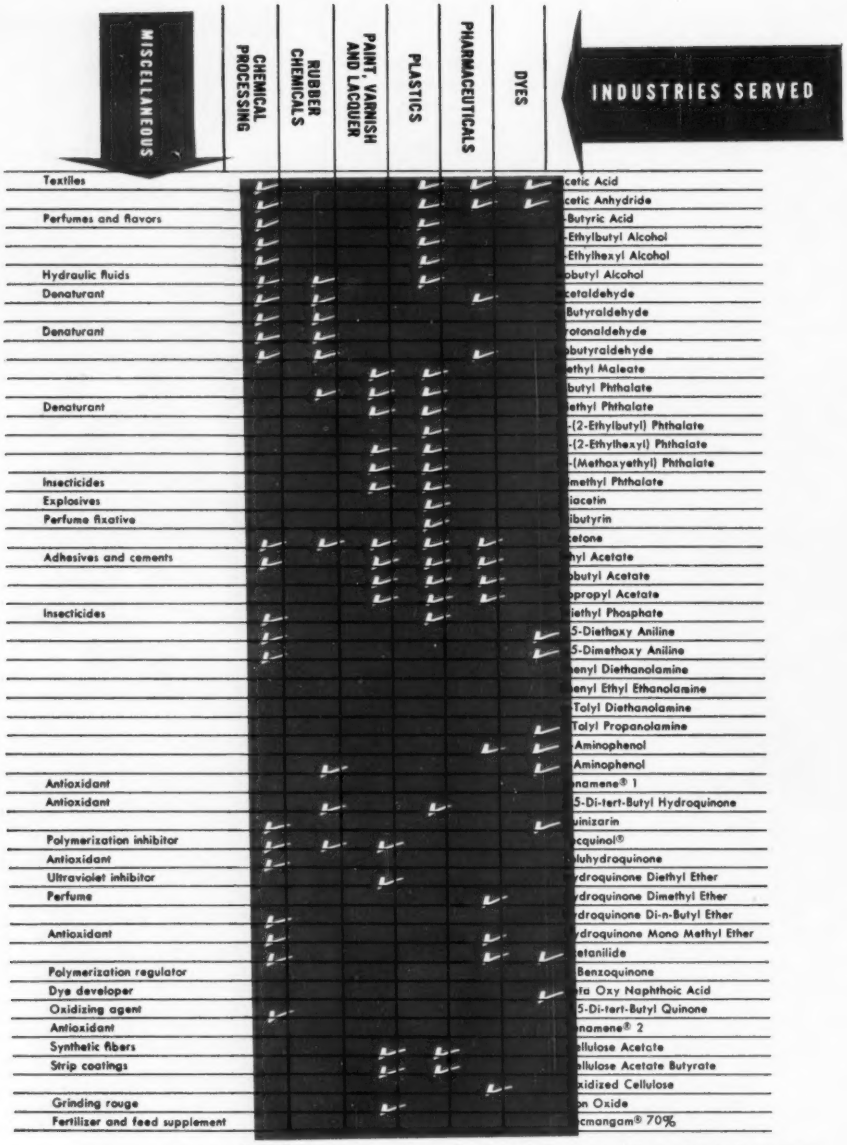

Specifications, properties and other typical uses of these chemicals are contained in the Eastman Industrial Chemicals catalog. Write for your copy.

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TENNESSEE EASTMAN COMPANY *Division of Eastman Kodak Company* **KINGSPORT, TENNESSEE**

J. R. HOOVER: More synthetic from the same equipment.

chemicals needed to promote the reaction. He adds that the product is more uniform and the process easier to control.

Hoover did not disclose the actual sequestering agent that is employed but a safe bet would be that it's one of the Versenes made by the Bersworth Chemical Co. (Framingham, Mass.). Earlier this year (*CW, Jan. 19*), Bersworth told CW that Versenes used in synthetic rubber production were resulting in capacity increases of 10%-30%.

Moreover, at least one other synthetic producer, Goodyear, says it is using Versenes in the processing. About three months ago it switched over to the use of Versenes in its oil-extended cold rubber production. It says, however, that although the capacity of the reactors was increased, recovery equipment had to be expanded before the over-all output boost could be realized.

EQUIPMENT . . . .

Change of Name: Because its name led the public to an erroneous idea about the company's line, Worthington Pump and Machinery Corp. last week decided to become simply Worthington Corp. President Ramsey explained: "We believe that continuous reference to 'pumps' in the corporate name tended to lead the public to think that pump manufacture was our only endeavor. Such, of course, is not the case."

•

Plastic Flowmeter: Brooks Rotameter Co. (Lansdale, Pa.) has brought out a new purge meter that eliminates packing glands and glass parts. Flow rate is visibly indicated by the position of float in the metering tube; the tube and all piping and connections are bored from a block of acrylic plastic. The new meter is available in two models for measuring flows where a high degree of accuracy is not necessary. One has etched reference marks for approximate flow indication; the other, standard calibrations for either air or water. Both are suitable for pressures up to 100 psi within a temperature range of 180-200 F.

•

Porous Steel: Smooth-surface, porous stainless steel sheets with high tensile strength are now available, says Micro Metallic Corp. (Glen Cove, N.Y.) Applications suggested by the manufacturer: rotary vacuum filters cleaned by blowback, vacuum plate filters, fluid catalyst filters where the nature of the cake does not permit easy discharge by blowback, and other solids collection services. At a pressure differential of 10 psi., flow capacity for the material is as high as 200 cfm. for air (per sq. ft. of filter surface); 20 gpm. for water.

•

New Dryer: Two to four times the evaporative capacity of previous models is the big feature of the addition to its line of Turbo-Dryers, reports Wyssmont Co. (Long Island City, N.Y.). The new units (the "N" series) are supplied in package form, have variable speed drives, both to rotate the tray structure and to change speed of the turbo-fans.

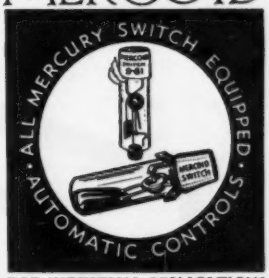
•

Soft Water Treatment: Heller Laboratories (Jersey City, N.J.) is pushing its Hydroton process for eliminating scale in heat-exchange equipment. The process changes water electrophysically, says Heller, so that minerals crystallize out as a sludge and do not form a hard surface over heat-exchange surfaces. It is said to eliminate the need for water softeners for controlling hard water scale in boilers, evaporators, condensers and other equipment. The company reports some 20,000 installations, most of them in England, but says it is catching on in this country also.

•

Resistant Relay: General Electric (Schenectady, N.Y.) is now introducing a general-purpose, hermetically sealed relay for use in airplanes, ships and portable land-based electrical systems and electronic equipment. Designed to conform to MIL-R-6106 (Military Service Specifications for Relays), the new relay resists corrosive atmospheric conditions.

MERCOID



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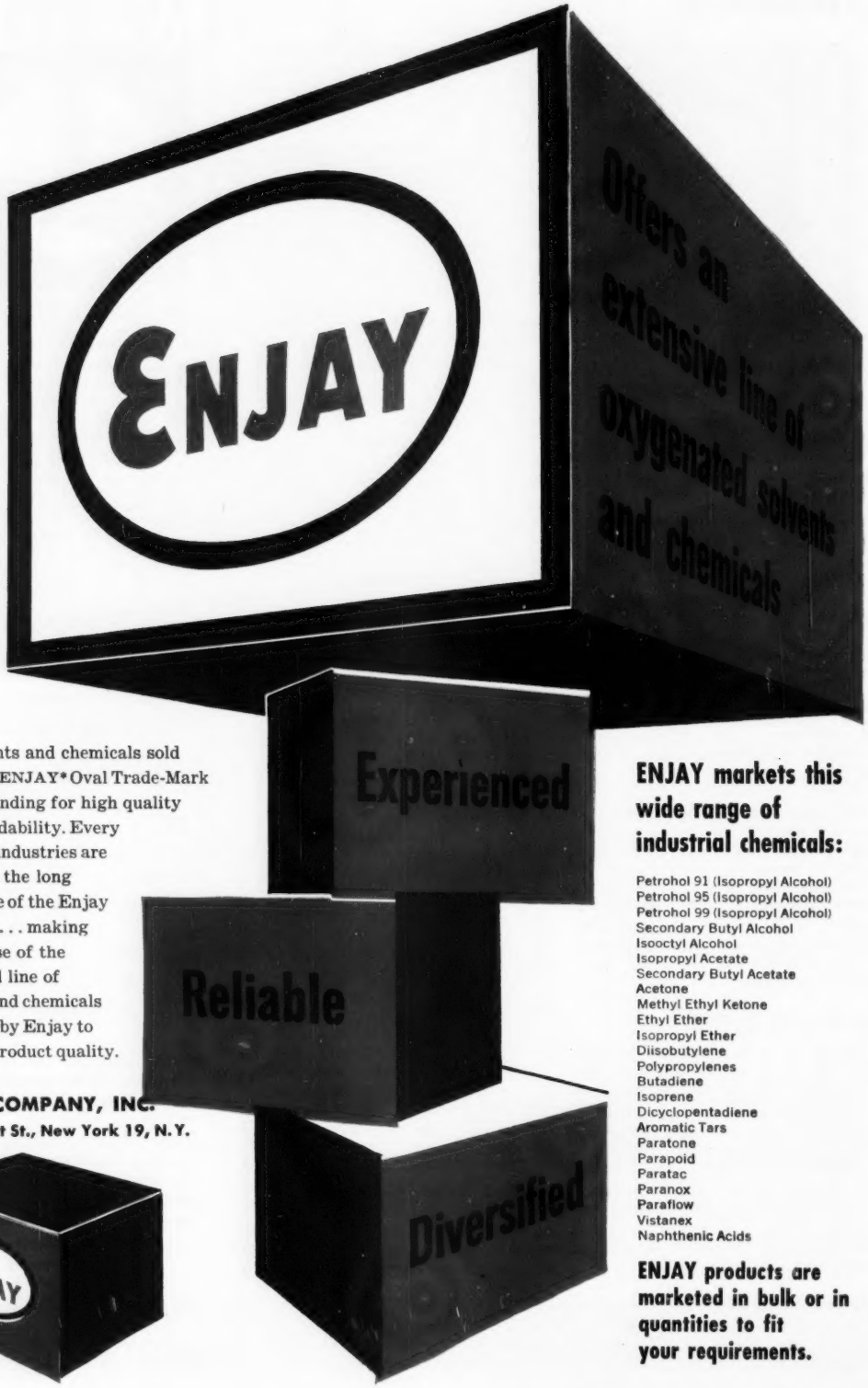

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BOOKS . . . . . .

Diffusion In and Through Solids, second edition, by Richard M. Barrer. Cambridge University Press, London and New York; xiii + 464 pp., $9.

A study of the processes of permeation, solution and diffusion, reviews experimental methods and their mathematical and physical interpretations. Lists of permeability and diffusion constants are included.

Performance of Lubricating Oils, by H. H. Zuidema. Reinhold Publishing Co., New York, N.Y.; viii + 179 pp., $5.

Book summarizing and evaluating data on performance characteristics of lubricating oils, approaches subject from performance standpoint (such as oxidation, bearing corrosion, wear, etc.) rather than from specific application basis.

Readings in Personnel Administration, by Paul Pigors and Charles A. Myers. McGraw-Hill Book Co., New York, N.Y.; xii + 483 pp., $4.50.

A collection of writings by social scientists and practitioners in the field of personnel administration, stresses philosophical aspect, basic problems and limitations. Principal ideas covered include an analysis of personnel administration, role of the foreman, building of work teams, wages and work assignments, and employee programs.

Unit Processes in Organic Synthesis, fourth edition, by P. H. Groggins. McGraw-Hill Book Co., Inc., New York, N.Y.; xiii 937 pp., $12.50.

As in previous editions, this volume is concerned with the fundamentals underlying unit processes—as involved in the converting of organic raw materials into usable products. Stressed in this edition is the significance of kinetics and thermodynamics in chemical engineering.

Methods of Analysis of Fuels and Oils, by J. R. Campbell and W. Gibb. Chemical Publishing Co., Inc., New York, N.Y.; 216 pp., $4.

A laboratory guide to the evaluation of gaseous, liquid and solid fuels, the book discusses theoretical basis of test methods, selected analytical methods, standard procedures, and test apparatus.

Briefly Listed

How to Supervise People, third edition, by Alfred M. Cooper, 254-page book intended as a method-guide for the supervisor covering his responsibilities in department production, industrial safety, and employee morale. McGraw-Hill Publishing Co., 330 West 42nd St., New York, N.Y.; $3.75.

Manometric Methods, third edition by Malcolm Dixon, 165-page monograph on manometric methods as applied to the measurement of cell respiration and other processes. Cambridge University Press, 32 East 57th St., New York, N.Y.; $2.

Survey, 1951 review of the chemical industry in the two-state region of Texas and Louisiana, with reference to all new plants and expansion projects announced during last year. South Texas National Bank of Houston, 213 Main St., Houston, Tex.; copies free of charge.

Geologic Guidebook of the San Francisco Bay Counties, 392-page book (Bulletin 154) discusses region's history, geology, minerals, industry, routes to travel, etc. Division of Mines, Ferry Bldg., San Francisco, Calif.; $2.50.

Concentration of Oxide Manganese Ores from San Bernardino County, Calif., by W. W. Agey, reports results of laboratory tests for determining whether manganese ore from this area can be concentrated by ore-dressing methods. Bureau of Mines, 4800 Forbes St., Pittsburgh, Pa.; free on request.

MEETINGS...

Natl. Agr. Chemicals Assn., spring meeting, Fairmont Hotel, San Francisco, Apr. 6-9.

Amer. Pharm. Manuf. Assn., annual meeting, Boca Raton Club, Boca Raton, Fla., Apr. 7-9.

Amer. Soc. of Lubrication Engineers, annual meeting & lubrication show, Statler Hotel, Cleveland, Apr. 7-9.

Soc. of the Plastic Ind., annual conf., Edgewater Beach Hotel, Chicago, Apr. 9-11.

Amer. Zinc Inst., annual meeting, Statler Hotel, St. Louis, Apr. 21-22.

Assn. of Consulting Chemists & Chem. Engrs., general symposium, Belmont Plaza Hotel, N.Y., Apr. 22.

Amer. Ceramic Soc., annual meeting, Pittsburg, Apr. 27-May 1st.

Amer. Oil Chemists' Soc., annual meeting, Shamrock Hotel, Houston, Apr. 28-30.

Amer. Drug Manuf. Assn., annual meeting, Homestead Hotel, Hot Springs, Va., Apr. 28-May 1.

Natl. Air Pollution Symposium, Huntington Hotel, Pasadena, May 5-6.

Tech. Assn. of the Pulp & Paper Ind., Sherman Hotel, Chicago, May 5-8.

Scientific Apparatus Makers Assn., annual meeting, Edgewater Beach Hotel, Chicago, May 6-9.

Inst. of Paper Chemistry, annual executives' conf., Appleton, Wisconsin, May 15-16.

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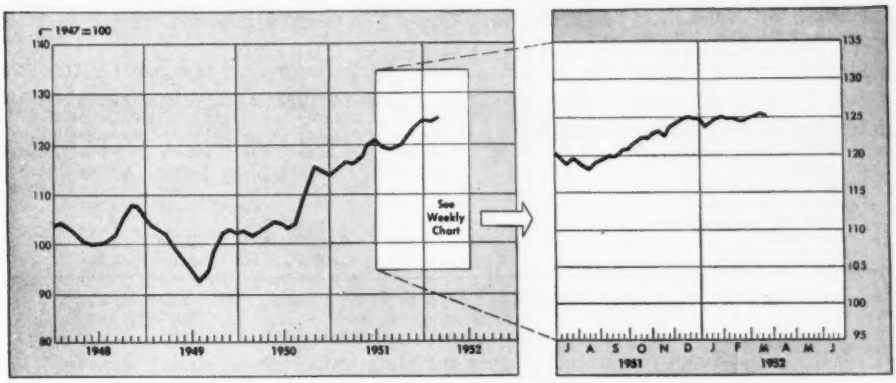

CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries

MARKET LETTER

Two drug manufacturers carried on the succession of antibiotics price cuts this week. Eli Lilly trimmed 10-35% from its various penicillin products. Parke, Davis & Co. made reductions ranging up to 44% on seven penicillin types, and 33% on products based on streptomycin and dihydrostreptomycin.

In the case of penicillin, this marks the second price cut for each company since the first of the year.

Oil well drillers will be less hampered from now on by the restrictions on the use of quebracho. Most of them have had to get by with only 60% of pre-Korean usage despite rising oil production.

Reasons for getting more: increase in Argentine imports, wider application of synthetic water-soluble gums.

Viscose rayon has meant good business for one major producer—American Viscose—even though textiles generally have lagged. American is still selling its full production of rayon staple, high tenacity tire yarn. Textile yarn sales remain slack but inventories are now at the point that usually spells "buying."

Most people are surprised by the chloroform shortage, not realizing the expansion of demand. Production now running about 26 million pounds a year is fully taken up by: 1) Drugs and antibiotics—15 million; 2) Chlorinated plastics—9 million; 3) Carbon tet anti-freeze additive for extinguishers—over a million. Two million pounds additional capacity this year will bring but a minor supply improvement.

Lanolin, made from wool grease, is twice in the news this week. Price ceilings and production are both too low for adequate supplies needed in cosmetics, soaps, paints and many specialty products.

Price relief for producers is expected soon, but production can't be stepped up in a short time. Reason: raw material comes from wool scouring, and wool operations are still moribund.

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	125.1	125.1	118.2
Bituminous coal production (daily average, 1000 tons)	1,588.0	1,628.0	1,698.0
Steel ingot production (thousand tons)	2,131.0	2,127.0	2,069.0
Stock price index of 14 chemical companies (Standard & Poor's Corp.)	232.9	233.3	215.9
Chemical process industries construction awards (Eng. News-Record)	$38,602,000	$6,450,000	$27,375,000

MONTHLY BUSINESS INDICATORS—TRADE (Millions of Dollars)	MANUFACTURERS' SALES			MANFACTURERS' INVENEORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	$22,958	$21,183	$22,560	$42,007	$41,999	$34,120
Chemicals and allied products	1,523	1,408	1,628	2,998	3,000	2,383
Paper and allied products	696	601	688	1,028	1,005	761
Petroleum and coal products	1,962	1,927	1,811	2,520	2,535	2,191
Textile products	1,092	1,110	1,314	2,748	2,814	2,662
Leather and products	205	208	329	572	567	613

Supply controls for paper and metal containers are going to get fewer and easier. Two reasons: improved supply of packaging materials, stationary or lower demand for many packaged products at retail levels.

Chances of getting more tin are brighter as the price impasse starts to break up. This week the U.S. contracted to take half of Belgium's output for two years at $1.18 a pound. Other and bigger suppliers—Bolivia and Indonesia—will probably settle soon around the same figure.

The superphosphate fertilizer program will be strapped less than expected, on the basis of sulfuric limitation to 90% of 1950 use. Current outlook is for only 3% less superphosphate than a year ago. Three factors underlie this improvement: 1) use of more spent and byproduct acid; 2) expanding base period standard, and 3) smoothing out regional distribution.

Fixed nitrogen supply is up at least 10% over last year's. Facilities now on the way will bring an additional 10% for next year and 25-30% more the year after. Urea will spearhead the trend toward solid nitrogen fertilizer. Over 500,000 tons will be available by 1955 if DPA certifies pending applications.

One producer of nonionics—Wyandotte—is launching a stronger market bid for its polyoxypropylene glycol-based Pluronics. Double action: bringing prices down, upping output. Cuts range from 1½-7½¢ a pound.

Glycerine, ample now, will become even more so. Still-tumbling fats-and-oils prices will bolster competitive position of soap, glycerine coproduct; 50% more glycerine will be turned out in 1952 than last year; and rising fatty acid demand will also add to glycerine supply.

Another polyol—sorbitol from Atlas—has just taken a price cut, fourth since the multiple output expansion that started less than two years ago. "Sorbo" 70% solution grade is now ½¢ a pound less in tankcars; other reductions range from ¼-1¢ a pound.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending April 5, 1952

DOWN

	Change	New Price		Change	New Price
Castor Oil, No. 1, tanks	$.0075	$.3175	Shellac, superfine	.01	.38
Naphthalene, crude, imp.	.01	.08	Tallow, fancy	.0025	.05375

All prices per pound unless quantity is stated

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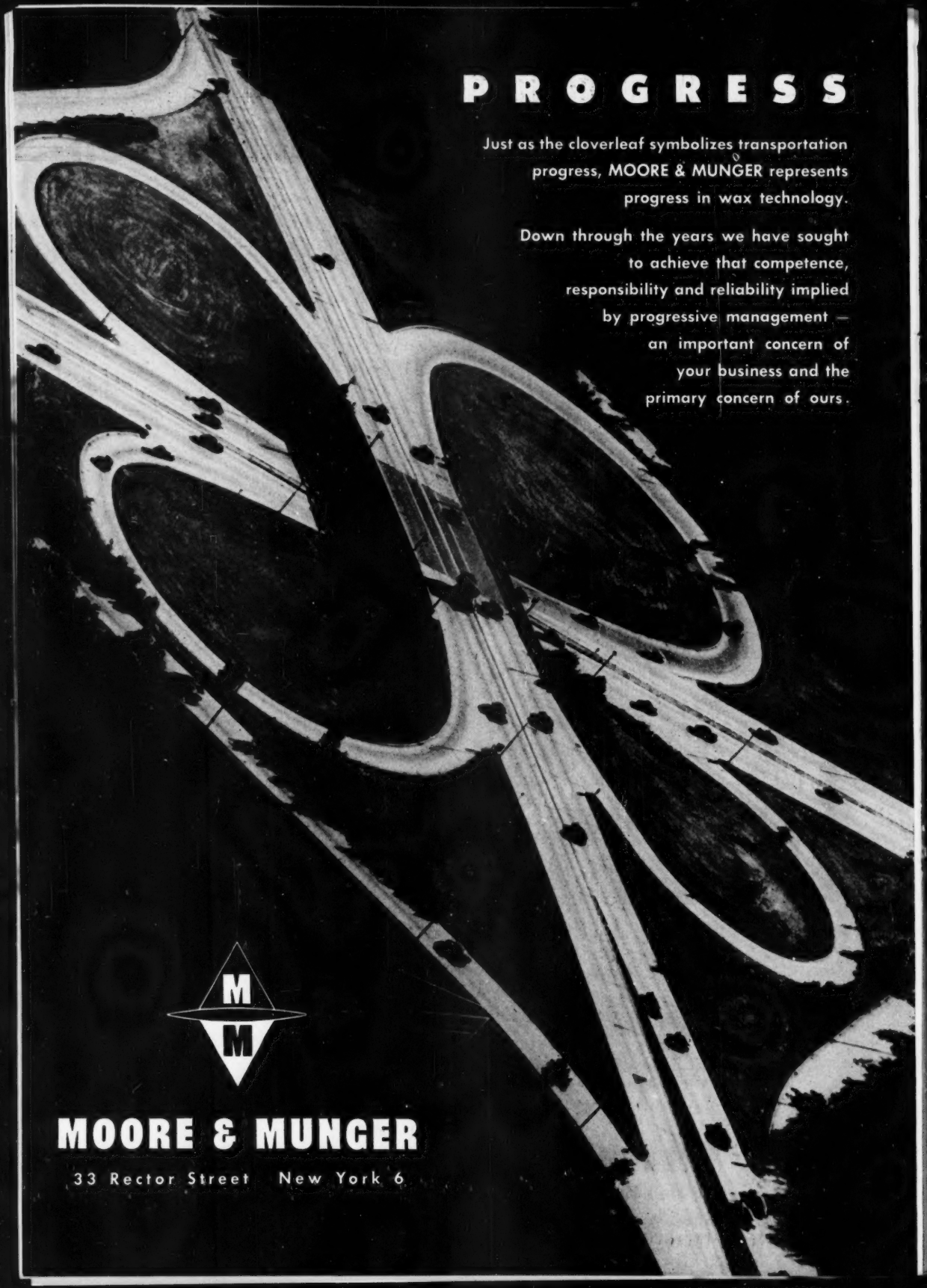
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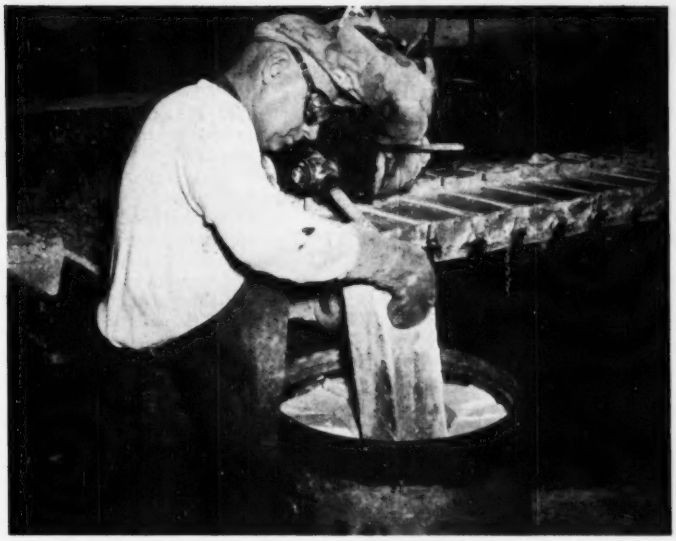

SHIPPING SODIUM: New uses, more products will tell how much.

Sodium to Diversify

Ethyl Corp. is expanding sodium and TEL capacity at Houston, but expansion by National Distillers has been halted.

Reasons behind these moves: demand for TEL has been strong, but sodium needs for alkyl sulfate have not grown as expected.

All three sodium producers are now scouting for market diversification. Best potential: sodium peroxide.

Last week two expansions of sodium capacity were underway. This week there is only one—Ethyl Corp.'s new plant at Houston. The second, an addition by National Distillers Chemical Corp. to its Ashtabula, Ohio plant, was called off when an anticipated increase in sodium demand for alkyl sulfate failed to materialize. The third producer, Du Pont, though not expanding in sodium, is pushing ahead on new capacity for tetraethyl lead (TEL) at Deepwater, New Jersey.

Behind these developments is the fact that Ethyl and Du Pont, longer established than National in the manufacture of sodium, dispose of most of most of their output—about 70%—for TEL manufacture. National—which has only been in the sodium business since June 1, 1950—has sold much of its output for non-TEL purposes. One of its chief customers: Procter & Gamble, whose sprawling Ivorydale plant on the outskirts of Cincinnati takes multi-million pound quantities of sodium for the reduction of glycerides to lauryl or other fatty alcohols. These are converted to alkyl sulfates which are the main ingredients of Drene, and a substantial part of Tide.

By Reduction: But future growth of this sodium outlet has two competitive trends to buck. One is: how will alkyl sulfates fare relative to other detergents? The other depends on process competition between sodium reduction and high pressure hydrogenation in making the glycerides. Each process appears to have economic advantages, and future expansion is expected to be nip-and-tuck between them. For instance, P&G will continue to use sodium reduction at Ivorydale and in its new plant coming in at Kansas City next month. But the plant at Long Beach, Calif. will keep on using hydrogenation, and chances are good that its new unit going up at Sacramento will do so also. Generally, sodium reduction appears to have the advantage of lower investment, while hydrogenation permits easier recovery of the glycerine value in the feed stock.

In addition to this process rivalry, the competition of other detergent

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materials with alkyl sulfates is a robust factor in sodium prospects. First there is competition from other synthetic detergents, especially the more economical, petroleum-based alkyl aryl sulfonates which go into Tide and many other major household and industrial detergents. Too, currently the entire detergent business is trying to shake off a 10-20% slump brought about by (1) the effects of overbuying last year and (2) the stronger position of soap in a low cost-level fats and oils market. The latter development is, however, also favorable for alkyl sulfates.

TEL-cast: For the two major producers, these detergent worries are of less consequence than they are to National, because most of their output goes for TEL which is not only the biggest use, but also the fastest-growing. In 1947, TEL accounted for 50% of the sodium production, 65% of a greater production in 1948 and late this year should be taking close to 75%. But happy as this makes producers, they know it may not be advisable to depend too heavily on one outlet.

A recent nationwide survey showed that TEL hasn't been keeping pace with the increase in octane rating for motor fuel. Whether this has been due more to TEL allocations or to greater use of aromatics, the next report will reveal.

Green Fields: Nothing sudden is likely to happen to affect the demand for more TEL, but both Ethyl and Du Pont are playing safe by exploring other sodium outlets. Du Pont is already making products like sodium peroxide, sodium cyanide, and sodium hydride; Ethyl Corp. is looking into these too and may have a few more up its corporate sleeve. National Distillers has worked out a continuous process for sodium peroxide on a larger than pilot plant scale.

The peroxide is tabbed for future growth that should multiply the present output of around 15 million pounds. Biggest boost will be for groundwood bleaching, where some prefer it to hydrogen peroxide. Sodium for use in making organic intermediates and pharmaceuticals, though small, is growing up fast. These potentialities will spur the three producers in their drive for market diversity.

Government Needs

Bid Closing	Invitation No.	Quantity	Item
Headquarters Air Materiel Command, Dayton, Ohio.			
Apr. 14	52-795B	7 items	Acid various types
Aviation Supply Office, 700 Robbins Avenue, Philadelphia, Pa.			
Apr. 8	MIPR 52 263 CSD 3Q	7150 gal	Varnish shellac spec TT V 91B amend 1
Apr. 10	MIPR R52 260 CSD3 Q	16000 lbs	Putty pure linseed oil spec TT P 791A amend 1
Commanding Officer New York Chemical Procurement District, 180 Varick Street, New York 14, N. Y.			
Apr. 11	Cml-30-070 52-62B	522600 lbs	Zinc carbonate basic spec Nr 96-111-90 dated 13 January 47
Procurement Division, Supply Service, Veterans Administration, Washington 25, D. C.			
Apr. 14	A-107	2928 btl	Acetylsalicylic acid tablets
		4224 btl	Ammonium chloride tablets
		9000 tubes	Atropine sulfate tablets 1/150 gr
		5400 tubes	Atropine sulfate tablets 1/100 gr
		492 btl	Ferrous sulfate tablets
		1920 btl	Glyceryl trinitrate tablets
		6912 btl	Ascorbic acid tablets

Government Awards

Item	Amount	Dollar Value	Supplier	Location
New York Quartermaster Procurement Agency, 111 East 16th Street, New York 3, N. Y.				
Compound, dishwashing, type I, hard water	2136000 lbs	145,440	The Clarkson Labs., Inc.	Philadelphia
Compound, dishwashing, type II, soft water	377000 lbs	27,076	Contract Packaging Corp.	New Jersey
Headquarters, Air Material Command, Dayton, Ohio.				
Hydrogen peroxide		198,750	Becco Sales Corp.	Buffalo
Paint remover	62400	97,096	Starco Chemical Co.	Houston
The Navy Purchasing Office, New York, N. Y.				
Disinfectant, germicides & fungicides	9300 gal	30,940	Onyx Oil & Chemical Co.	Jersey City
Calcium carbide	1000000 lbs	55,876	Pacific Carbide & Alloys Co.	Portland
Rope, orlon	21300 lbs	71,035	Puritan Cordage Mills	Louisville
Disinfectant, deodorant blocks	201000 lbs	40,032	G. Greene Mfg. Corp.	Wash., D.C.
Purchasing and Contracting Branch, The Engineer, Center & Fort Belvoir, Fort Belvoir, Virginia.				
Calcium acrylate	68000 lbs	46,716	Rohm & Haas Co.	Philadelphia

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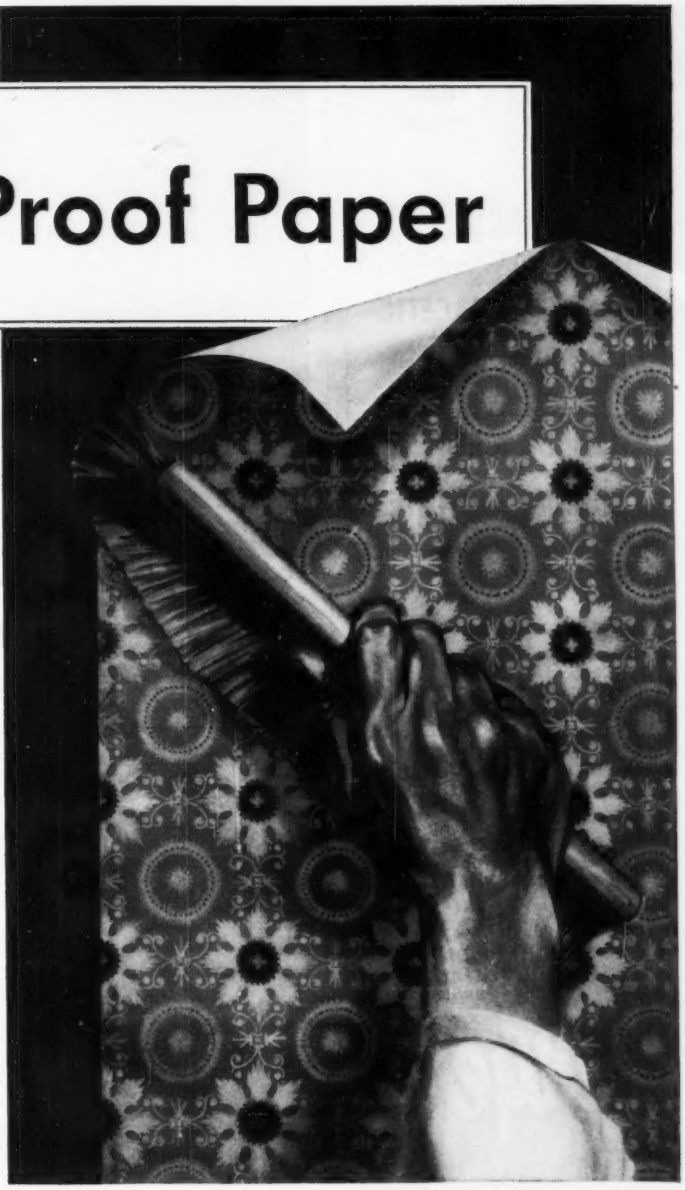

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CCDA PANEL: New product development means new markets, new customers.

Customer Calls Tune

New product development is everybody's job, but sales and marketing departments play loudest since the customer really calls the tune.

Commercial Chemical Development Association hashes over place and meaning of new product development, decides that in chemical industry it means survival.

Last week, at the CCDA's meeting in New York's Hotel Statler, J. Oostermeyer, Shell Chemical's president, found the pulse of the meeting without even being there. Crux: It's Marketing and Sales that do the talking on new product development, because customers shout in their ears.

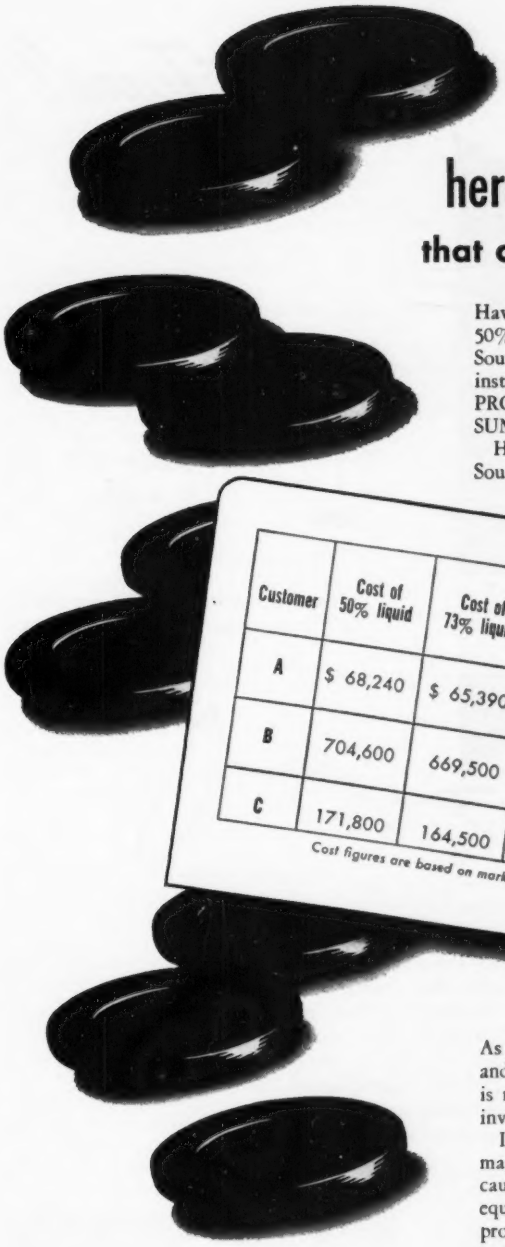
In his talk, delivered by proxy, Oostermeyer made this simple statement, ". . . The primary job of product development [is] to assess the marketing risk . . . When you sink money in a new plant, it is the Marketing V.P. who says, 'I can sell so much for such and such a price.' He has the responsibility. He should have the authority to see that the product development job is done to his satisfaction."

The first half of this was the succinct essence of the CCDA men's thoughts, but the latter was the fuse that touched off the meeting's fireworks: Where does new product development belong in a company's setup? This is one of those questions that are never solved for Research, Sales, and Independent champions loudly vie with each other. But during the fray a clear picture of the job of a modern development group emerged.

Sales Dominant: Whether or not the development group is actually under Sales, sales and marketing are the dominant factors in developing any new product. All agree on this. Unless research's new products become commercial successes, the research department, and the company, will soon wither.

The primary job of development is to bring new products to market as quickly and as lucratively as possible. To do this it performs many functions along the line of distribution and marketing. One of its basic activities is to look for new opportunities and select the particular ones which will provide new profits for the company. This means both finding uses for what research comes up with, and getting research to work on things development has found a real need for. Unless research jobs are selected and developed with full appreciation of the ultimate commercial picture—price structures, performance of possible competitive products, and other sales and distribution matters—chances for profit are slim.

Ability to Sell: It must perform the jobs that will enable it to form an accurate opinion of the company's



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Customer	Cost of 50% liquid	Cost of 73% liquid	Per Cent of Savings	Total $ Savings per year	Cost of equipment and installation necessary to effect such savings	Return on Investment First Year
A	$ 68,240	$ 65,390	4.2%	$ 2,850	$2,650	108%
B	704,600	669,500	5%	35,100	3,500	1003%
C	171,800	164,500	4.3%	7,300	2,055	355%

Cost figures are based on market prices and freight rates effective January 1, 1952

As you will note from the study, the cost of the equipment and installation necessary for this profitable changeover is more than offset by the first year's savings. The small investment earns big dividends.

It will pay you to investigate today the extra profits that may be yours by making this change in your purchase of caustic soda. There is no problem in securing the diluting equipment. The system has been thoroughly tested and proved by over 10 years actual experience in applying high grade 73% caustic soda.

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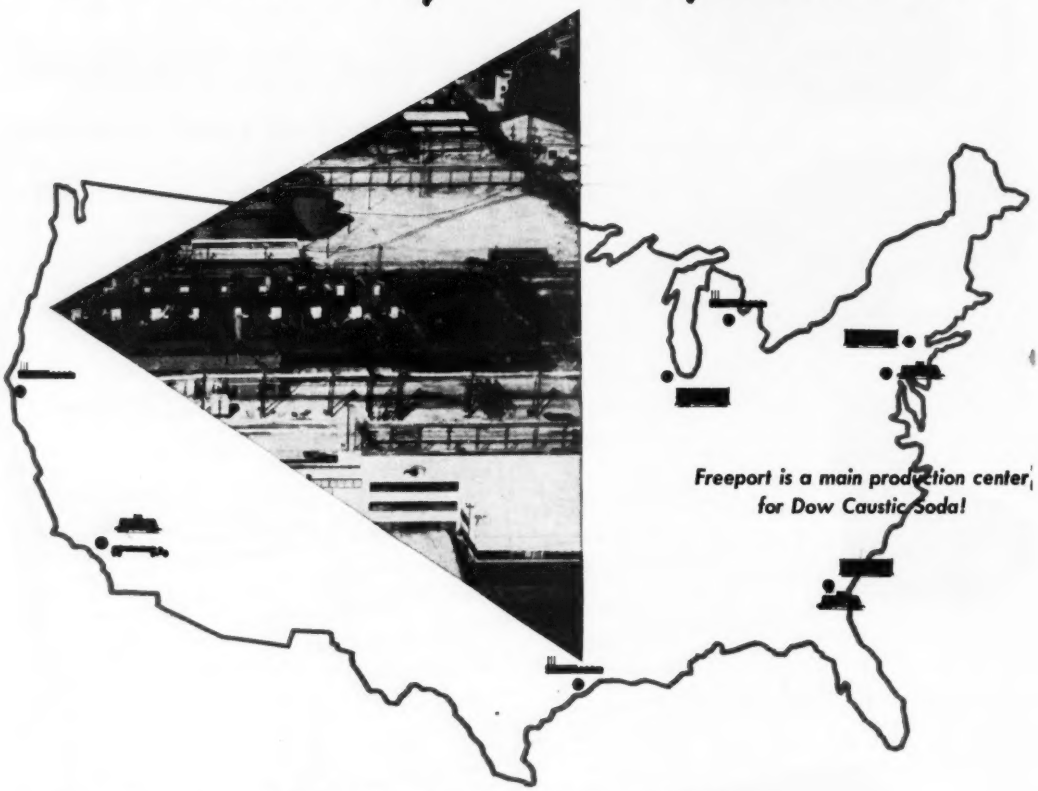

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ability to market a new product. It must survey and test markets for the new products. Very often this job of market research begins before research really gets under way, when the product is still just a gleam in a chemist's eye. The final product is always largely a matter of Sales saying what it wants, and the rest of the company producing it that way if at all possible.

It is the Sales Department, or someone acting as a sales department, that says how the product should be packaged, what physical form it will take, how it is to be sold, where and to whom. When the development men are preparing information sheets, brochures, and advertisements, they are doing promotion and advertising. When Technical Service gets into the act it has one eye solidly on the customer, and just how to give him the type of product he wants.

King Customer: In the final analysis, new product development is largely a matter of going to the customer and finding out if he's interested in it. Further, it is often a matter of going out and finding out what he wants, and then going back and developing it. The chemical development man is the most anxious-to-please man in the industry: if he's working on a product and you don't like it, he'll change it. If you don't even like the idea, he'll take your idea and get work done on it instead. He's almost wholly a distribution man; his creed: no sales, no profits, no company.

All product development is actually two jobs going on at once; distribution development and production development. After the test-tube stage, production is wrestling with making the product, while distribution is finding how, where, when, and for how much, to sell it. They work from both ends toward the middle, which is the finished product with a ready market.

As Pfizer's executive vice president, John L. Davenport, pointed out at the meeting, "The companies which have shown the greatest progress in the chemical industry in the last few years are those whose income is derived from products which were unknown 10 to 15 years ago." And that means that development has become less research and more distribution.

Nitrate Trek

North Carolina consumers of calcium ammonium nitrate are paying much more for it these days. Reason: The chemical must trek all-around-the-mulberry-bush because it is barred from unloading at North Carolina ports.

The material—world-famous since its near cousin's Texas City performance—is definitely on the Coast Guard's blacklist of materials that need special treatment. As a result CG regulations prevent unloading it at Eastern North Carolina ports, such as Wilmington or Morehead City.

The latest shipment, barred from Wilmington, was unloaded last week at Charleston, S.C. The entire 80,000 lbs. will be shipped by truck and rail to its destination in Eastern North Carolina. By the time it gets into the hands of users each 100-lb. bag will cost nearly 50% more than if it had been unloaded at Wilmington, and farmers aren't happy over this.

Less Leakage

A canny railroad man has come up with a simple gimmick to minimize leakage from tank cars without any trouble at all. Trick: Special asbestos fibers in the tanks.

Tiny leaks in tanks have long been an annoyance to shippers who sent liquids over long distances. Whether it was acid, edible oil, fuel oil, molasses or pitch, the only way to prevent loss on long hauls was to sidetrack the car and transfer the liquid contents to another car or tank.

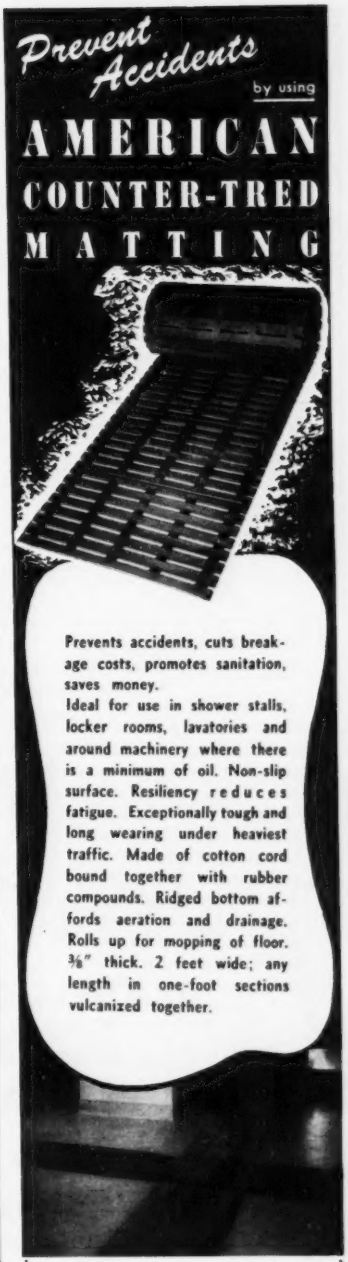
Now, by simply putting a small amount of asbestos fiber into the liquid, the pinholes are quickly stopped up, and the tank will ride relatively leakless to its destination where it can be overhauled. Naturally the asbestos will have to be of special purity if used in high-quality chemicals or edible liquids.

Follow the Flow: The best way to use the asbestos is to draw off a small amount of the liquid in a pail. Mix the asbestos into this to form a slurry which can be poured into the tank. In the tank the fine asbestos fibers follow any flow or current present in the liquid. This carries the fiber to the point of leakage where it mats across the crevice to form a plug.

•

Urea Campaign: Plakson division, Libbey-Owens-Ford Glass Co., has under way a major consumer push to make the public crave urea-formaldehyde plastics.

Built around a series of four-color ads in *Saturday Evening Post*, which will be repeated later in trade magazines so as to reach the distributor and fabricator, the campaign plans to build consumer demand for products made with Plaskon urea. Counter cards, consumer mailing pieces, window displays, and special promotional events will all be pressed into the service of extolling urea plastic's beau-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Tax War: Ohio has declared all bets off and opened fire on Pennsylvania truckers with application of a tax to that state's vehicles. Claiming that the wily Keystoners broke the Ohio-Pennsylvania no-tax pact by levying one against Ohio truckers last Dec. 27, Ohio is out for money. The Ohio tax is $20 for trucks and $30 for tractors, will net the state some $250,000 a year.

Next on Ohio's list will be New York if that state goes through with its ton-mile tax. At present it has a "hands-off" reciprocal agreement with New York.

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Linguistic Sorbitol: A 24-page Spanish edition of its manual on sorbitol has been printed by the Atlas Powder Co. Describing the history, chemical structure and uses of sorbitol and related polyols made by Atlas, the book is free.

•

Distribution Center: A six-story building in Boston is the latest acquisition of Hilton-Davis Chemical Co., a division of Sterling Drug. The structure will serve as the northeastern distribution and service center for the company's dyestuffs.

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Tin Tips: For information on tin production and marketing developments, you can now go to the newly opened Malayan Tin Bureau located in Washington, D.C.

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No Royalties: Metal Hydrides, Beverly, Mass., has a new policy for its sales of lithium aluminum hydride. The material will now be available for commercial consumption free of any use royalties. There will be no increase in price, and new facilities are expected to go on stream soon.

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Branch Office: Glass Fibers Inc., Toledo, Ohio, has opened a new branch sales office in New York City.

•

Consolidation: Arthur S. LaPine, Chicago distributors of chemicals and scientific apparatus, is consolidating office and warehouse facilities in one building. New location: 6001 S. Knox, Chicago.

PICTURES IN THIS ISSUE:

Cover (center)—Standard Oil, (N.J.); Cover (bottom) and p. 63—Cornell Univ., Dept. of Agriculture; p. 22 — Ross R. Ghiselin Photo; p. 47—Frank J. Gilloon Photo; p. 58—Sid Karson, McGraw-Hill; p. 66—Jules Schick.

SPECIALTIES . .

Ready for the Mites

Kolker Chemical's new miticide plant focuses attention on burgeoning phase of "ag chemicals" competition. Four, maybe five miticides will be marketed in quantity this year.

Gunning for top spot is Naugatuck Chemical with Aramite: The company sees giant market in cotton growing.

But it won't be a shoo-in for Naugatuck. Dow, Du Pont, Kolker and Sherwin-Williams are in the national battle, too, and Stauffer may be in by fall.

With its Newark miticide and insecticide plant in production less than a month, Kolker Chemical (subsidiary of Diamond Alkali) becomes the fifth major producer of specific miticides. In addition, Dow, Du Pont, Naugatuck, and Sherwin Williams are set for the spring demands for mite controls.

Naugatuck Chemical (division of U.S. Rubber) is gunning for No. 1 position with its Aramite this year.

HOTHOUSE MITE KILLING: Aerosols for inside job.

Backed by plenty of consumer-level publicity, both free and paid (examples: article in February *Coronet;* full page, three-color ad in March 10 *Time*) Naugatuck is pushing Aramite for nearly everything but use on pears.

Prime target in Aramite's sights is the red spider mite on cotton. The hot, dry weather last summer enabled mites to do enormous damage to the cotton crop; one estimate put the loss at nearly half a billion dollars.

All-out this Spring: But it will be no one-company show; unlike previous years, miticide competition will be all-out for the first time this season. Du Pont had EPN 300 for 1950's crops; Sherwin-Williams limited amounts of Dimite then. Last year, Dow was trying Ovotran (as K-6451), Kolker had pilot lots of K-101, and Naugatuck was completing tests with Aramite.

One reason the miticide (or acaricide) market has not shaped up before is mites have been a severe problem only the past few years. In a sense, the mite worry was born of marvelously effective insecticides. Almost too efficient, pesticides wiped out the natural insect enemies of mites. Thus unchecked, mite hordes swarmed in orchard, garden, and shade tree.

Lime and sulfur mixtures, oil sprays, and rotenone sprays, which had been suitable before, couldn't cope with the suddenly increased mite population. Agricultural researchers, backed by the chemical producers, centered attention on the problem; they've produced several effective controls now, and are continuing tests.

In addition to the acaricides heading for national distribution, perhaps another one will be ready soon. Stauffer Chemical is straining to put Sulphenone *(CW, April 28, '51)* on the nationwide market by fall at least. And Geigy is testing its first specific miticide this year.*

Formulator's Chance: Dow, Kolker, and Naugatuck sell their basic products to formulators who retail miticides under their own labels.

California Spray-Chemical Corp., for example, will sell Aramite as Ortho-Mite, and Niagara Chemical (division of Food Machinery and Chemical Corp.) will sell it as Niagaramite—both available to the consumer as 2,3 and 4% dusts, 15% wettable powders, and emulsion formulations. Naugatuck markets only

* Effective chemicals in these miticides are: Ethyl p-nitrophenyl thionobenzene phosphonate (Du Pont EPN 300); di-p-chlorophenyl methyl carbinol (Sherwin-Williams Dimite); p-chlorophenyl p-chlorobenzene sulfonate (Dow Ovotran and Kolker K-101); β-chloroethyl β-(p-tert-butylphenoxy)-α-methyl ethyl sulfite (Naugatuck Aramite); 4, 4′ dichlorobenzilic ethylester (Geigy 338); p-chlorophenyl phenyl sulfone (Stauffer's Sulphenone).

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the 15W formulation, which is added to water and sprayed.

Kolker is selling its product only to formulators; Mitran is one name of a K-101-based compound. California Spray-Chemical will use both Ovotran and K-101, and several other firms have contracted for them too.

Pests Aplenty: There's a wide variety of mites to contend with. Probably most familiar to the householder is the red clover mite, which has invaded homes from Levittown, on Long Island, to Los Alamos, New Mexico.

The red spider or red mite infests nearly every cultivated plant species. Feeding on the leaf undersides, it causes a yellowing, mottling effect, sometimes leaf drop. Spruce mites plague the evergreens; European mites chew on fruit tree leaves; and citrus mites eat into the orange crop.

And not only are mites destructive on their own. They reduce size and productivity of trees, make them more susceptible to attack by pests and diseases.

The USDA Bureau of Entomology and Plant Quarantine and the Forest Service have been vitally interested in these miticides. In experiment stations in Indiana and at Yakima, Washington, all four of the mite killers ready for big sales this year have proved out well on the 8-10 species of mites bothering apple trees.

Ovotran is said to affect fruit flavor somewhat; USDA is withholding recommendation for use on apples. On the other hand, Ovotran is "most promising for acidulous fruit."

Like Aramite, the other acaricides are usually supplied as wettable powders; emulsions and dusts of some are available. Cost averages about $1 per hundred gallons of sprayable liquid, and six gallons will drench the average small tree.

Because mites thrive especially well just after insecticides like DDT have been used, most acaricide producers recommend co-spraying. Fortunately, most of the miticides are compatible with the insecticides.

Formulation Factors: Several factors enter into miticide formulation besides mite killing ability.

- Toxicity to personnel applying the spray must be considered, as well as toxicity to those likely to contact the sprayed plant.
- If a residual effect is preferred to a quick kill, the acaricide must not only remain potent in the applied form, but must stick to the plant through weathering.
- Phytotoxicity – damage to the plant being treated—cannot be too great.

From the standpoint of toxicity, none of the miticides is as hazardous as some of the common organo-phosphate insecticides handled safely by trained operators. Nonetheless, those handling EPN 300, K-101, and Ovotran are advised to use care. Dimite and Aramite are considerably less toxic.

All these new miticides show good residual effectiveness, a big advance over previously used controls. Pyrethrum-rotenone (and mixes synergised with piperonyl cyclonene), parathion, and the new systemic insecticide octamethylpyrophosphamide offer quick kill, but poor residual action. Lime and sulfur, fair residually, harm plants (phytotoxic).

Phytotoxicity has been fairly well eliminated in the new products. But Aramite isn't recommended for pears because of a slight damaging effect, and USDA is wary of Ovotran's being used on apples—though more from a taste-affecting standpoint. (This, apparently, is the reason California Spray-Chemical is deferring incorporation of Ovotran in its own formulations as had been planned.)

MITICIDE SPRAYING: Follow-up after insecticides.

Plant damage is particularly important to the greenhouse man. Conditions are favorable to mite development 12 months per year, and plants are valued on their beauty and perfection (estimated retail worth of hothouse plants exceeds $600 million). Parathion and TEPP aerosols are used now; Ovotran and Aramite have shown up well in tests.

There's another problem common to the agriculture chemical field—reproducibility of results from season to season – which has been harassing

Stauffer with its Sulphenone. Early nationwide tests were very promising; then last year erratic results were noted. At present, Sulphenone, showing up consistently good in control of apple and pear tree pests, is offered to orchardists in Washington State and British Columbia only.

Stauffer is trying to discover reasons for the varied test results, hopes to have the difficulties ironed out by fall.

No one can predict how bad the mite situation will be this coming season. In the national forests, USDA has a program for detection and control under way. (Forest Pest Control Act, 1947), but won't guess about the coming summer. But at any rate, there will be plenty of effective weapons for combatting the mites.

Suds and Wax Car Cleaner

Since the silicone based auto polishes bounced into the news a couple of years ago, there have been few big changes in the polish phase of the car specialties business. But Choldun Mfg. Corp. (New Haven, Conn.) hopes to jar the trade with its new Purple Magic, an auto shampoo with a water-soluble wax, claimed to clean and polish at the same time.

It's not a new claim, and other makers of competitive items are frankly skeptical, but this is what Choldun says Purple Magic will do: One bottle-capful added to a bucket of water produces a solution which will launder a car, and leave it with a waxed surface. At a cost of about 10¢ per car.

Eric Eichwald, Choldun's chief chemist, explains it this way: He's spent two years developing the basic wax, an amino-acid wax of vegetable origin, which he says is harder and has a higher melting point than carnauba. Water-soluble in the Purple Magic formulation, it undergoes a chemical change when it is applied, leaving a durable finish. Patent applications for the new wax and for Purple Magic have been filed; until they are granted, Eichwald won't say more.

Other formulators have tried shampoo-wax combinations, say they don't work out too well. Prime difficulty is that a detergent must be incorporated to remove old wax and grime, and this leaves an unsuitable base on which to deposit the wax in the compound. Purple Magic skirts this by not removing the old wax.

Choldun has been producing equipment for professional auto washers for some time, and supplying the necessary chemicals also. Right now, all Purple Magic is being handled by the car scrubbing firms and service stations. But Eichwald wants to sell it to the auto owner, and all that's holding Choldun up, he says, is a shortage of bottling facilities.

With production limited (Choldun hopes to be set for full-scale operation by June), there has been no big promotion campaign. Few other specialties men have heard of Purple Magic. Doubt among them is in part due to the past poor performance of combination cleaners and polishes containing emulsified mineral oils.

Eichwald sees a potential of 3 million 16-oz. bottles (at $2 each) per year. He's enthusiastic—he's the inventor—about the wax, but in literature currently distributed to the trade, he plays down the polish angle of the new concentrate. Distribution is nationwide, but only to service stations.

Hyman Loses Again

Julius Hyman, Colorado agricultural chemical producer, may soon be a company without a product if court decisions continue to go against it. Recent ruling by the District Court of City and County of Denver, in a suit brought by Velsicol Corp., restrains Hyman from making or selling any more Aldrin or Dieldrin.

Neither Velsicol, Hyman, nor Shell Chemical, who has been marketing aldrin and dieldrin, will make any comment on the situation as it stands now.

Velsicol says it will make the two chemicals, and puts in a plug for chlordane (exclusive manufacturing and selling rights to which it won in another suit with Hyman in 1950, along with a $1.5 million settlement) and heptachlor, its other farm chemicals.

Shell Chemical is uncertain just where it stands, and terms the situation as being in a state of "flux." A good bet: It will continue to distribute the chemicals no matter who is making them.

Hyman, whose plant burned partially a few weeks ago, can appeal the case to a higher court, as was done unsuccessfully in the chlordane affair. But whether it will or not, it won't say. And just what it will do with the stocks of aldrin and dieldrin it has on hand and cannot market, it won't reveal either.

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Aluminum Adhesive: Ciba Company, Inc. (Kimberton, Pa.) has developed a new adhesive strong enough to make lap-joints of aluminum alloy. Ciba's

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Neoprene Coatings: Chemical Coatings and Engineering Co., (Chester, Pa.,) has been established to make corrosion control coatings based on Neoprene. Products range from heavy duty tank linings to compounds for maintenance coating.

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Insecticide Plant: John Powell & Co. Inc., insecticide concentrates supplier, has just established a new plant in Omaha, Neb. Part of Powell's decentralization program, the new plant has facilities for making parathion, DDT, 2,4-D formulations; toxaphene and chlordane concentrates.

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Plasticware Detergent: A new machine-dishwashing compound tagged Aura has been introduced by Calgon, Inc. (Pittsburgh, Pa.) A white powder, Aura is said to work equally well for plasticware, silver, china, and glassware. Packages: 300- and 100-lb drums.

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Termiticide: For the householder, a new termite control product: Arab U-Do-It, made by Federal Chemical Co.'s Arab Pest Control Co., Inc. (Indianapolis). A liquid concentrate for mixing with water (100 parts water to one of U-Do-It), the product sells for $8.95 per pint, $44.95 per gallon, with quart and half gallons also available.

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New Fed Specs: Emergency Federal Specifications which permit conservation of strategic materials have been set up for these products: TT-E-0506b: Enamel, Interior, Gloss, Tints and White, and TT-E-0543: Enamel Undercoat, Interior, Tint and White. Copies obtainable (at 10¢ each) from Superintendent of Documents, Government Printing Office, Washington, 25, D.C.

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Australian Invasion: Nicholas Pty. Ltd., (Melbourne, Australia), plans to start selling its headache remedy Aspro, in North America soon. It may also build a plant here to make Aspro in the U.S.

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Black News: Aromex 115, high abrasion furnace black is being sold by J. M. Huber Corp. (N.Y.C.). For synthetic rubber stocks, the new black is designed to improve wear, conductivity and ease of processing.

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Fluoridation Note: The University of Oklahoma has produced a new compound for fluoridating drinking water. Flural, as it is called, is made by reacting sulfuric acid with bauxite and calcium fluoride.

Advantages: Concentrate is claimed to be "less toxic" than products now used, is easily added with ordinary alum treating equipment.

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Pfizer Ointments: Chas. Pfizer & Co., Inc. (Brooklyn) has introduced two new formulations of bacitracin: Topical ointment, in ½-oz. tubes for skin infections and wounds; ophthalmic ointment, in ⅛-oz. tubes for ocular infections. Both products contain 500 units of bacitracin per gram.

Soap Stock

Purchase in one recent week of 2.6 million bars of soap by the New York Quartermaster Procurement Agency underlines the market for soaps and detergents in the Armed Services.

Some 135 million pounds of various types of soap have been purchased by the NYQMA in the past 15 months. Laundry, hand-scouring powder, floating, toilet, and dishwashing soaps are the top items.

Firms interested in quoting should contact: NYQMA, 111 East 16th Street, New York 3, N.Y. Announcements concerning soap purchases are published in CHEMICAL WEEK, may also be obtained from the Department of Commerce regional and district offices.

Lindane Vaporizer

LINDANE CRYSTALS are vaporized in a new electric unit designed to eliminate insects from the home. Called the Morton Vaporizer, the device is being filled by H. J. Baker, inventor and president of the Exterminator Corp. of America. Price: $6.95.

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BOOKLETS . . . . . .

Chemicals

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32-p. booklet entitled, "What's a Silicone," answers its lead query by investigating the action of silicones in polishes, water repellents, fluids, release agents, lubricants, defoamers, protective coatings and electrical insulation. Dow Corning Corp., Midland, Mich.

Hydrogen Peroxide

26-p. bulletin, "Progress In Peroxide," by H. O. Kauffmann and F. P. Greenspan, reviews oxidizing and reducing properties, bactericidal and fungicidal properties, applications and reaction characteristics of two peróxygen chemicals—hydrogen peroxide and peracetic acid. Buffalo Electro-Chemical Co., Inc., Buffalo, N.Y.

Antibiotic Feed Supplements

24-p. brochure on the use of antibiotics in feeds, discusses three antibiotic supplements — Baciferm-5, Duoferm, and Penbac (a combination of two antibiotics) —as to specific uses in poultry, swine and calf rations, advantages of each, quantities necessary, in addition to details on mixing directions, availability and supply. Commercial Solvents Corp., 17 East 42nd St., New York, N.Y.

Vinyl Acetate Polymers

4-p. folder covering vinyl acetate polymers and copolymers in solution and emulsion form with reference to properties, compatibility of the solutions and emulsions with modifiers, use of plasticizers, and potential applications of the resins. National Starch Products, Inc., 270 Madison Ave.. New York, N.Y.

Metal Cleaning

Bulletin entitled, "Cleaners for Effective Metal Cleaning," reviews six different methods of metal-cleaning and lists various cleaners to be used for aluminum, brass, bronze, copper, steel, iron, etc., along with application data for each type cleaner. Hanson-Van Winkle-Munning Co., Matawan, N.J.

High Abrasion Furnace Blacks

85-p. booklet contains individual sections comparing the performances of the firm's high abrasion furnace blacks with those of competitive blacks, as they are used in natural rubber, standard GR-S X-539, "cold rubber," neoprene type GN, neoprene type W, etc. Also appearing here are electron micrographs of particles, an outline of properties, and a discussion of mixing and testing procedures. Witco Chemical Co., 295 Madison Ave., New York, N.Y.

Equipment

Motors and Controls

30-p. brochure discussing the co-ordinated application of motors and controls in solving general application problems common to the chemical industry such as corrosion, hazardous locations, outdoor service, minimum space and weight, and the difficulty of getting centralized control. Illustrated with cutaways, sketches and photographs. Westinghouse Electric Corp., Box 2099, Pittsburgh, Pa.

Power Drives

20-p. catalog covering variable-speed drives, geared motors, and constant normal-speed motors in drip-proof, totally enclosed and pipe-ventilated designs. Construction features and operating details are illustrated and explained. Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles, Cal.

Gear Motors

8-p. bulletin containing information on fractional-horsepower gear motors along with cutaway drawings, selection charts, and dimension tables for both concentric-shaft and right-angle shaft gear motors. General Electric Co., Schenectady, N.Y.

General

Company Products and Services

12-p. bulletin explaining the relationship of the firm's five operating units (plastics, glass, metal, packaging and machine design) and describing the facilities available for dealing with industrial problems involved in product development, product manufacture and packaging. Emhart Mfg. Co., 333 Homestead Ave., Hartford, Conn.

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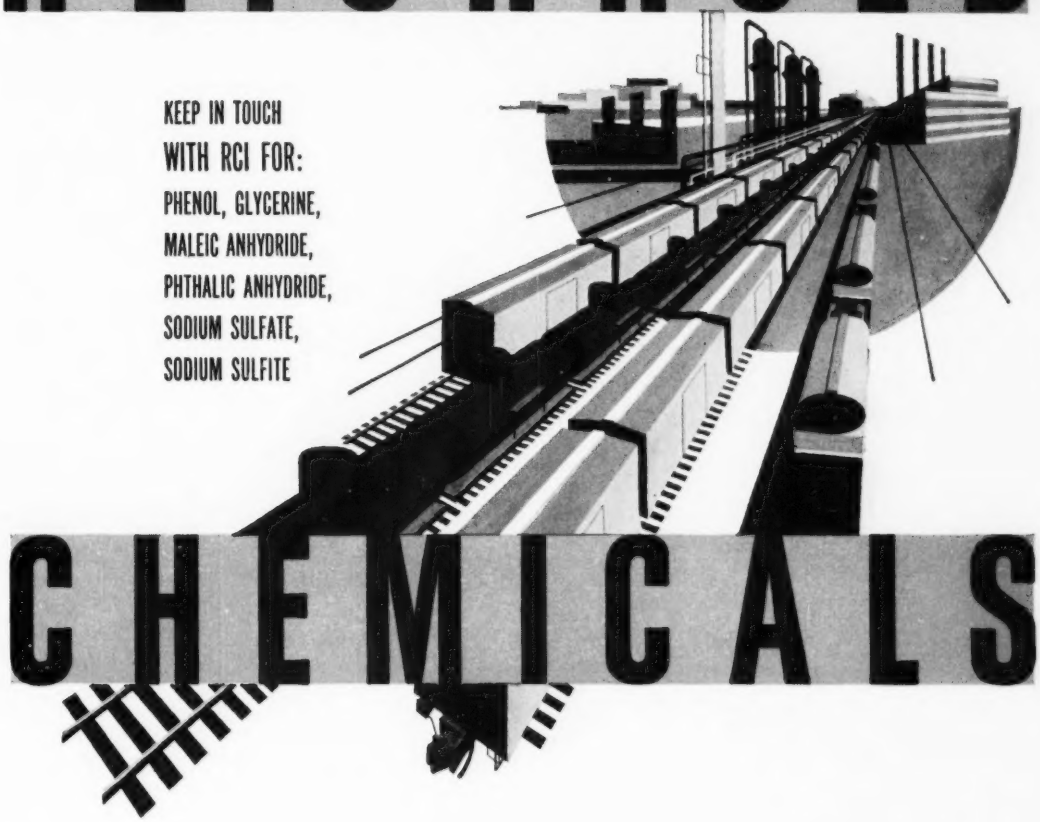

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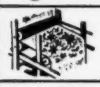

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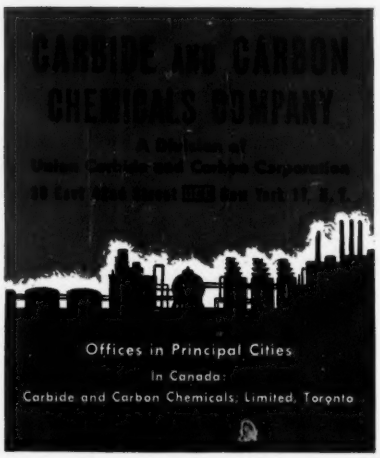
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